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December 11, 2020

Ms. Kelly Lee Kinkaid PG; Licensed Professional Geologist

Pennsylvania Department of Environmental Protection Bureau of Waste Management 909 Elmerton Avenue Harrisburg, PA 17110-8200

REF: 3rd Quarter 2020 Form 19, 50 and 52 Submittal Frey Farm Landfill; BWM Permit #101389

Dear Ms. Kinkaid:

In accordance with the Municipal Waste Management Regulations, the Lancaster County Solid Waste Management Authority (LCSWMA) continues the above-referenced monitoring program.

ARM Group has provided an analysis for the groundwater, leachate, and contiguous landowners data. ARM Group's report is attached to this submittal.

Groundwater:

In accordance with the Municipal Waste Management Regulations, the Lancaster County Solid Waste Management Authority (LCSWMA) continues the above-referenced monitoring program.

Attached are the Forms 19 (quarterly parameters), laboratory reports, and data export excel file for uploading the data into your LandLinks Access database.

Leachate:

In accordance with both the Pennsylvania Municipal Waste Management and the Federal Subtitle D Regulations, the Lancaster County Solid Waste Management Authority (LCSWMA) continues to complete the above referenced monitoring program. Enclosed is the Department's Form 50 - "Municipal Waste Landfill Leachate Analysis" for the quarterly monitoring period.

- LCSWMA continues to monitor the Form 50 parameters from location FFLEINFS. This location is the leachate collection system for the Frey Farm Landfill and represents "raw" leachate characteristics for the facility, as collected from the six (6) landfill cells.
- As indicated on the Form 50, the primary leachate collection and secondary detection



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systems encompass approximately 93 acres of drainage area including the Stage 1 of the Vertical Expansion.

- At DEP's request, we have included analyses of the four (4) secondary individual detection zone discharges with an individual Form 50 for each.
- Included on the CD are files which contains the FFLEINFS data in a compatible format for your LandLinks software. The CD also contains a pdf file of the laboratory results and the Form 50.

In accordance with Section 273.255(d)(1)(2) and (3) of the Municipal Waste Management Regulations, the Lancaster County Solid Waste Management Authority (LCSWMA) is providing this secondary flow report.

The 3rd Quarter 2020 Frey Farm Landfill (FFLF) secondary flow was noted at 1.26 gallons per day per acre (gpdpa); which is below the regulatory limit of 100 gpdpa. The 3rd Quarter 2020 secondary flow was 1.07% of the primary flow, which is below the regulatory 10% (maximum). Table 1 indicates this quarter's weekly flow information for the six (6) operational cells at the FFLF, cells 2 and 4 continue to indicate no secondary flow present.

 Consistent with all previous monitoring events, LCSWMA remains well below the secondary leachate flow threshold (100-gpdpa)

Contiguous Landowners:

Attached are the Forms 52, laboratory reports, and a data export excel file for uploading the data into your LandLinks Access database.

Please do not hesitate in contacting me if you have any questions or concerns at dbrown@lcswma.org.

Respectfully submitted,

Daniel A. Brown

Daniel a. Brown

Environmental Compliance Manager

Enclosures

Cc: LCSWMA: Environmental, John Ridinger, Aaron Rice

PA DEP: Ed Rawski, Randy Weiss



ARM Group LLC

Engineers and Scientists

December 7, 2020

Mr. Daniel Brown
Environmental Compliance Manager
Lancaster County Solid Waste
Management Authority
1299 Harrisburg Pike
PO Box 4425
Lancaster, PA 17604

Re: LCSWMA Frey Farm Landfill

Permit No. 101389 Manor Township

Lancaster County, Pennsylvania

Third Quarter 2020 Water Quality Data Review

ARM Project 190783

Dear Mr. Brown:

ARM Group LLC (ARM) has prepared this assessment at the request of the Lancaster County Solid Waste Management Authority (LCSWMA) to evaluate the Third Quarter 2020 water quality monitoring results for Frey Farm Landfill (FFLF). As part of this evaluation, ARM reviewed the historic and Third Quarter 2020 laboratory analytical results for the sampled upgradient and downgradient Form 19 groundwater monitoring wells, Form 50 leachate collection and detection zones, and Form 52 contiguous private wells.

The groundwater, leachate, and contiguous private well samples collected by LCSWMA during the Third Quarter 2020 were analyzed for quarterly Form 19, Form 50, and Form 52 parameters, respectively. The following narrative provides a summary of noteworthy observations of the results for the Third Quarter of 2020, as well as a general discussion of recent data trends.

Background/Upgradient Parameter Concentrations

To determine if the concentration of a given parameter at each groundwater monitoring location is elevated compared to the background/upgradient concentration, ARM calculated the 95% upper prediction limits (UPLs) using historical data from the upgradient well, FFMP002W (MP-2), using laboratory analytical results provided by LCSWMA from the First Quarter 2009 through the most recent quarter (Third Quarter 2020).

The UPL approach is used to predict the upper limit of possible future values based on a background data set. A 95% UPL established from background data represents the upper limit which will predict if an independently obtained future sample result exceeds background levels with 95% confidence. If the concentration of a given parameter in a downgradient well exceeds its established UPL, this represents a statistically significant exceedance of background groundwater quality.

To calculate the UPLs, ARM first applied the Dixon's and Rosner's Tests for outliers in ChemStat® statistical analysis software (version 6.3.0.2, Starpoint Software, Inc., ©1996-2013) to identify potential historical anomalous concentrations in MP-2. The Dixon's Test applies to populations of 3-25 values, and the Rosner's Test is valid for populations of more than 25 values. ARM identified 44 statistical outliers at a 95% significance level in the historical dataset which did not appear to be part of a long-term concentration trend. No outliers were identified from the Third Quarter 2020 analytical results.

The most appropriate method of calculating a UPL varies according to the distribution of each dataset. After removing outliers, ARM assessed the remaining historical MP-2 concentration data for each parameter to determine the best fitting statistical distribution (i.e., normal, lognormal, gamma or no distribution) at a 95% significance level using the EPA's ProUCL statistical analysis software (version 5.1.002, EPA, 2015). ARM then used ProUCL to calculate the 95% UPLs for each parameter, which are summarized in the enclosed **Attachment 1**. The exported ProUCL statistical calculation sheets are included in the enclosed **Attachment 2**.

For pH, a one-sided UPL is not appropriate because of the double-sided nature of this parameter. ARM assessed the downgradient pH data by investigating time-series concentration plots for identifiable trends and comparing the Third Quarter 2020 results to the historical range of concentrations in both the sampled well and the upgradient well.

The Interstate Technology and Regulatory Council (ITRC) recommends that a UPL should only be applied for background populations of at least 8-10 observations. Use of smaller populations containing either fewer measurements or multiple non-detections can result in skewed datasets and statistically flawed UPL calculations.

The background population is less than 8 for all quarterly volatile organic compounds (VOCs), chemical oxygen demand (COD), dissolved iron, and total phenolics because of a historical lack of detections in MP-2. A background level could therefore not be accurately calculated for these parameters, which are labeled with asterisks in the enclosed **Attachment 1**. ARM substituted the laboratory reporting detection limit for the statistical background standard when assessing these parameters in the downgradient wells due to their historical absence in the upgradient groundwater.

The attached **Table 1** summarizes the background exceedances in the downgradient Form 19 wells during the Third Quarter 2020. The attached **Table 2** summarizes the background exceedances in the downgradient Form 52 wells during the Third Quarter 2020. Background exceedances shown in **Tables 1 and 2** denote a statistically significant increase of concentrations relative to those observed historically in the upgradient well MP-2. Close attention should be

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paid to results from the monitoring locations with noted water quality changes during future sampling events to evaluate the presence of any positive or negative trends for the parameters of concern.

Individual Form 19 Well Summary

- MP-2 No parameters are above the statistical background level in this upgradient well for the Third Quarter 2020, indicating that groundwater quality appears relatively stable upgradient of the site. Concentrations of several parameters increased rapidly in 2012 to historical high levels. All these concentrations have returned to apparently stable, long-term trends in line with historical average levels since 2014. pH has fluctuated over a range of approximately 1.0 unit since 2014 but appears to have a stable long-term trend. All other Form 19 analytical parameters appear to be stable and within historical concentration ranges.
- MP-5 Parameters above background in this well include calcium, chloride, magnesium, sodium, specific conductance (SpC), total dissolved solids (TDS), and total organic carbon (TOC). Concentrations of these parameters historically appeared stable until an increase in 2018. These concentrations decreased during 2019 and now generally appear in line with the historical averages. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.5 unit higher, on average, while fluctuating over a slightly wider range.
- MP-15 Chloride, magnesium, and nitrate were observed above background in this well. These concentrations appear to be increasing since early 2018 along with those of other parameters (calcium, potassium, sodium, SpC, and TDS) which still remain below background levels. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.6 unit higher, on average, while fluctuating over a slightly wider range.
- MP-16 Parameters observed above background in this well include chloride, magnesium, sodium, SpC, and TDS. Concentrations of these parameters appear to have a long-term stable trend with short-term fluctuations since approximately 2012. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.7 unit higher than background, on average.
- MP-17 Parameters observed above background in this well include calcium, chloride, magnesium, manganese, sodium, SpC, TDS, TOC, and total phenolics. Concentrations of most of these parameters appear to be increasing over time. Two instances of apparent rapid increases in concentration occurred during 2012 and 2016. After both events, these parameter levels have generally stabilized. Total phenolics have been sporadically detected in this well, although no long-term trend is apparent. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.7 unit higher than background.
- MP-18 Parameters observed above background in this well include chloride, magnesium, and sodium. Concentrations of these parameters appeared to spike during the First Quarter 2018 sampling event but have since returned to near-historical levels. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.4 unit higher, on average.



- MP-19 Chloride was observed above background in this well and appears to be increasing slowly in concentration over time. pH appears to mimic the trend observed in the upgradient well at levels approximately 1.5 units higher, on average.
- MP-25 Chloride and magnesium levels were observed above background in this well. Concentrations of these parameters appear to be fluctuating rapidly over time with a long-term, slowly increasing trend. pH appears to be increasing slowly since 2016 and is currently approximately 0.9 unit higher than background.
- MP-28 Parameters observed above background in this well include chloride, magnesium, sodium, and TDS. Chloride, sodium, and TDS concentrations appear to be elevated yet stable over time. Magnesium concentrations appear to be decreasing as a long-term trend with occasional fluctuations. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.6 unit higher, on average, while fluctuating over a slightly wider range.
- MP-29 Chloride was observed above background in this well and appears to fluctuate between 20-160 mg/L in a seasonal pattern. However, there does not appear to be a long-term increasing or decreasing trend. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.4 unit higher, on average.
- MP-2DW Parameters observed above background in this well include calcium, chloride, magnesium, sodium, SpC, TDS, and turbidity. These parameter concentrations appear to have increased from 2017-2018 but have since stabilized, apart from minor fluctuations, during the last several quarters. pH appears to mimic the trend observed in the upgradient well at levels approximately 2.1 units higher, on average.
- <u>MP-2SW</u> Parameters observed above background in this well include chloride, iron, sodium, TOC, and turbidity. Chloride and sodium levels appear to be decreasing over time. Iron, TOC, and turbidity appear to be fluctuating over relatively wide concentration ranges with an apparent slowly increasing long-term trend. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.6 unit higher, on average.
- MP-31 Iron, total phenolics, and turbidity were observed above background in this well. Iron and turbidity levels appear to be increasing slowly since the First Quarter 2018 sampling event. Total phenolics have been detected sporadically in this well, although no long-term trend is apparent. pH appears to mimic the trend observed in the upgradient well at levels approximately 2.0 units higher, on average, while fluctuating over a wider range.
- MP-32 Parameters observed above background in this well include ammonia-N, iron, manganese, and turbidity. Ammonia-N appears to be decreasing over time with occasional concentration fluctuations. Iron, manganese, and turbidity appear to be fluctuating rapidly but do not appear to show a long-term increasing or decreasing trend. pH appears to mimic the trend observed in the upgradient well at levels approximately 1.7 units higher, on average, while fluctuating over a wider range.



- MP-33 Parameters observed above background in this well include ammonia-N, chloride, and iron. Chloride appears to be fluctuating seasonally with a long-term, slowly increasing trend. The other noted parameter concentrations appear to be fluctuating but do not appear to show a long-term increasing or decreasing trend. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.8 unit higher, on average.
- <u>MP-3A</u> Magnesium levels were observed above background in this well but appear to be steady long-term, apart from minor fluctuations. pH appears to be increasing slowly over time and is currently approximately 0.3 unit higher than background.
- MP-4A Parameters observed above background in this well include alkalinity (bicarbonate and total), calcium, chloride, sodium, SpC, and TDS. All these parameter concentrations appear to be either stable over time or decreasing. Several metals concentrations observed in the Third Quarter 2020 (calcium, magnesium, and sodium) appear anomalously low relative to historical results. ARM will reassess these results in future quarters to determine if any apparent trends develop. pH appears to mimic the trend observed in the upgradient well at levels approximately 1.8 units higher, on average, while fluctuating over a slightly wider range.
- MP-26R Parameters observed above background in this well include chloride, magnesium, manganese, sodium, SpC, sulfate, and TDS. Most of these parameters appear to be increasing slowly since 2014. Sulfate and TOC appear to be fluctuating but not increasing long-term. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.4 unit higher, on average.
- MP-30R Parameters observed above background in this well include chemical oxygen demand (COD), chloride, magnesium, manganese, sodium, SpC, and TDS. Most of these parameter concentrations appear to be fluctuating across a relatively wide range of values with no apparent long-term trends. COD has been detected sporadically in this well, although no long-term trend is apparent. The Third Quarter 2020 result for COD appears to be anomalously high relative to historical results. ARM will reassess COD in future quarters to determine if any apparent trends develop. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.5 unit higher, on average, while fluctuating over a wider range.

Parameters not noted above are either at or below background levels. Overall, the groundwater quality at FFLF generally appears to be stable. Most parameters noted as being elevated above background levels do not appear to be increasing over time. Several parameters appear to be fluctuating but do not show an apparent long-term increasing or decreasing trend. ARM will continue to closely assess the noted parameters with increasing trends to see if any changes to the trends occur over time.



Form 50 Leachate Zone Summary

ARM reviewed the historic and Third Quarter 2020 laboratory analytical results for sample location FFLEINFS (grab samples collected from the combined flow from FFLF's primary leachate collection lines) and four (4) manholes which represent the secondary leachate detection zones (FFMH01SS, FFMH03SS, FFMH05SS, and FFMH06SS).

The combined primary leachate flow from FFLEINS tends to range between approximately 100-400 gallons per day per acre (gpd/ac) but does not appear to be increasing over time. Flows from the secondary zones appear to fluctuate seasonally, with the highest flows generally occurring in the first quarter and the lowest flows generally occurring in the third quarter. Flow from FFMH01SS tends to range between approximately 5-25 gpd/ac and appears to be decreasing since 2014. Flow from FFMH03SS tends to range between approximately 0.1-4.0 gpd/ac and appears to be increasing since 2018. Flow from FFMH05SS tends to range between approximately 0.1-2.0 gpd/ac and appears to be generally stable except for a short-term spike in the flow rate to 15 gpd/ac in early 2018; FFMH05SS flows have since returned to near-historical levels. Flow from FFMH06SS tends to fluctuate seasonally between approximately 0.2-5.8 gpd/ac but does not appear to be increasing over time.

Form 50 VOC Detections and Apparent Trends

2-butanone (MEK), 4-methyl-2-pentanone, and acetone were observed in FFLEINS in the Third Quarter 2020 and have been historically present in the primary leachate samples. MEK appears to fluctuate between approximately 30-1,300 μ g/L and appears to be gradually decreasing over time. 4-methyl-2-pentanone has been only been detected sporadically since 2014, and no long-term trend is apparent. Acetone appears to fluctuate between approximately 50-3,300 μ g/L and appears to be gradually decreasing over time.

1,1-dichloroethane, 1,4-dichlorobenzene, acetone, and ethylbenzene were detected in FFMH01SS and have historically been present at low levels (between 1-7 μ g/L). 1,4-dichlorobenzene and ethylbenzene levels appear to be very gradually increasing over time, and 1,1-dichloroethane and acetone appear to be stable over time apart from minor fluctuations.

Acetone was detected in FFMH03SS for the third time since 2016. These recent detections have all ranged between 10.5-14.5 μ g/L, which is only slightly greater than the laboratory detection limit of 10 μ g/L. ARM will continue to assess further detections to determine if any concentration trends become apparent.

Other Form 50 Detections and Apparent Trends

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Ammonia-N, barium, chloride, iron, pH, potassium, sodium, and TOC levels appear to be increasing long-term at FFLEINFS and FFMH01SS. COD, nitrate-N, SpC, sulfate, TDS, and TOC appear to be decreasing at FFMH05SS. Alkalinity, calcium, magnesium, and manganese concentrations fluctuate across a wide range of values in the historical leachate results, but no long-term trends are apparent for these parameters. ARM will continue to closely assess the noted parameters with increasing trends to see if any changes to the trends occur over time.

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Form 50 MCL Exceedances and Form 19 Subtitle D Parameter Analysis

Form 19 groundwater monitoring wells are subject to additional analysis of Subtitle D parameters at the next scheduled annual sampling event if secondary leachate samples collected from an upgradient cell are found to exceed the primary maximum contaminant limit (MCL) of a regulated compound. For the Third Quarter 2020, MCL exceedances were noted in the analyses for the secondary leachate samples collected from FFMH01SS (barium and cadmium) and FFMH03SS (nitrate). All wells downgradient of these zones should therefore be sampled for Subtitle D Form 19 parameters during the 2021 annual sampling event.

Form 52 Contiguous Private Wells Summary

ARM reviewed the historic and Third Quarter 2020 groundwater monitoring results for ten (10) contiguous privately-owned wells. Samples collected from these wells were analyzed for quarterly Form 52 parameters. The attached **Table 2** summarizes the background exceedances in the downgradient Form 52 wells during the Third Quarter 2020. Background exceedances shown in **Table 2** denote a statistically significant increase of concentrations relative to those observed historically in the upgradient well MP-2.

- <u>3044RIVERRD</u> Total magnesium was detected above background but appears to be stable and not increasing over time. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.6 unit higher, on average, while fluctuating over a slightly wider range.
- <u>3052RIVERRD</u> No parameters were observed above background in this well. pH appears to be slowly increasing since 2017 and is currently approximately 0.3 unit higher than the upgradient well.
- <u>3056RIVERRD</u> Total and dissolved magnesium were detected above background in this well. Concentrations of both parameters appear to be stable and not increasing over time. pH appears to mimic the trend observed in the upgradient well at approximately equal levels, on average, while fluctuating over a slightly wider range.
- <u>3060RIVERRD</u> COD and magnesium (total and dissolved) were detected above background in this well. COD has been detected sporadically in this well, and no long-term trend is apparent. Magnesium concentrations appear to be decreasing over time. pH appears to mimic the trend observed in the upgradient well at approximately equal levels, on average, while fluctuating over a slightly wider range.
- 3076RIVERRD Chloride, COD, dissolved sodium, and total organic halogen (TOX) were detected above background in this well. Chloride and sodium concentrations appear to be stable and not increasing over time. COD has only been detected twice in the historical record, and this is the first detection of TOX. No trends are apparent for either parameter. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.3 unit higher, on average.



- <u>3079RIVERRD</u> Chloride and COD were detected above background in this well. Chloride levels fluctuate in an apparently seasonal manner but do not appear to be increasing over time. COD has been detected sporadically in this well, and no long-term trend is apparent. pH appears to be slowly increasing since 2017 and is currently approximately 0.9 unit higher than the upgradient well.
- 3088RIVERRD Parameters observed above background in this well include total and bicarbonate alkalinity, chloride, COD, sodium (total and dissolved), SpC, TDS, and total phenolics. ARM understands that the property owner at this location installed a water treatment system in 2013 which coincides with several significant changes in parameter concentrations and trends (i.e., an increase in alkalinity, chloride, sodium, SpC, and TDS; and a decrease in calcium, magnesium, potassium, and sulfate). COD and total phenolics have been detected sporadically in this well, and no long-term trends are apparent. pH appears to mimic the trend observed in the upgradient well at levels approximately 1.6 units higher, on average, while fluctuating over a slightly wider range.
- <u>3100RIVERRD</u> Chloride and COD were detected above background in this well. Chloride appears to be decreasing after a peak in late 2016. COD has been detected sporadically in this well, and no long-term trend is apparent. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.5 unit higher, on average.
- <u>3106RIVERRD</u> Chloride, COD, magnesium (total and dissolved), and sodium (total and dissolved) were observed above background in this well. COD has been detected sporadically in this well, and no long-term trend is apparent. Concentrations of the remaining parameters appear to be decreasing over the last three quarters after increasing to a relative peak in the Fourth Quarter 2019. Since late 2015, pH appears to mimic the trend observed in the upgradient well at levels approximately 0.8 unit higher, on average.
- <u>3125RIVERRD</u> Chloride, COD, and sodium (total and dissolved) were observed above background in this well. COD has been detected sporadically in this well, and no long-term trend is apparent. Chloride levels fluctuate in an apparently seasonal manner but do not appear to be trending toward an increase over time. Sodium appears to be decreasing since the Second Quarter 2018. pH also appears to be increasing since early 2018 and is currently approximately 1.6 units higher than background.

Form 52 parameters not noted above are either at or below background levels. ARM will continue to assess the noted apparent trends in the Form 52 results to see if any changes in the trends develop.



Closing

If you have any questions regarding this water quality data evaluation, please contact the undersigned at 717-533-8600. ARM sincerely appreciates the opportunity to assist LCSWMA with its assessment of quarterly water quality data collected at FFLF.



Sincerely, ARM Group LLC

Ryan Brandon, P.G. Project Manager

Ryan a. Brandon

Scott Wendling, P.G.

Vice President, Sr. Project Manager

Enclosed: Tables 1-2

Attachments 1-2



TABLES



Table 1. LCSWMA Frey Farm Landfill Form 19 Groundwater Monitoring Well Background Standard Comparisons - 3rd Quarter 2020

Parameter	Background Standard	Units	FFMP002W	FFMP005W	FFMP015W	FFMP016W	FFMP017W	FFMP018W	FFMP019W	FFMP025W	FFMP028W	FFMP029W	FFMP02DW	FFMP02SW	FFMP031W	FFMP032W	FFMP033W	FFMP03AW	FFMP04AW	FFMP26RW	FFMP30RW
	-		1	1				Quarte	rly Analytes												
AMMONIA-NITROGEN	0.303	mg/L	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	0.737	0.612	< 0.100	< 0.100	< 0.100	< 0.100
BICARBONATE	132	mg/L	< 5	47	15	30	75	24	63	23	26	10	109	18	68	68	42	14	192	44	28
CALCIUM, TOTAL	72.5	mg/L	18.5	75.9	18.3	43.6	99.8	32.0	58.8	22.8	39.5	13.1	127	15.3	39.5	14.4	26.8	17.7	34.9	69.0	37.2
COD (CHEMICAL OXYGEN DEMAND)	15*	mg/L	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	61
CHLORIDE	30.9	mg/L	16.1	187	31.5	129	352	99.8	84.9	57.9	82.3	58.6	334	52.2	21.8	16.9	43.4	28.6	300	181	191
FLUORIDE	0.50	mg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
IRON, TOTAL	0.70	mg/L	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	0.47	1.0	3.2	9.7	6.8	< 0.067	0.25	< 0.067	0.069
MAGNESIUM, TOTAL	10.3	mg/L	7.9	18.5	24.0	19.1	42.8	15.8	5.7	12.4	16.6	9.4	20.0	5.7	4.0	5.3	9.1	12.9	10.1	18.5	16.2
MANGANESE, TOTAL	0.47	mg/L	0.22	0.092	0.064	0.043	1.7	0.24	< 0.0056	0.0096	< 0.0056	0.027	0.46	0.021	0.30	0.59	0.39	0.29	0.11	0.56	2.2
NITRATE-NITROGEN	28.6	mg/L	20.8	2.3	32.7	9.9	1.8	4.9	0.24	9.5	17.3	3.7	7.9	10.8	< 0.20	< 0.20	11.6	23.6	0.24	1.7	5.2
pH-FIELD	None**	S.U.	4.40	5.31	5.18	4.20	5.34	5.26	6.28	3.37	4.15	4.47	6.91	5.44	7.78	6.68	4.77	4.73	6.78	5.28	5.13
pH-LAB	None**	S.U.	5.25	6.14	5.87	5.88	6.47	6.14	7.07	6.16	6.08	6.39	8.06	6.33	7.86	7.48	6.30	5.52	7.77	6.13	6.41
POTASSIUM, TOTAL	13.4	mg/L	1.1	3.5	2.8	3.7	7.6	5.4	1.1	2.7	2.5	2.2	2.7	6.1	1.2	1.3	1.9	1.6	3.8	8.4	7.1
SODIUM, TOTAL	26.5	mg/L	14	49.3	23.9	42.4	94.6	34.4	10.8	20.0	27.5	21.7	127	42.6	10.7	13.6	13.8	12.5	26.6	59.6	95.5
SPEC. COND., FIELD	636	μmhos/cm	294	894	487	680	1,524	551	471	389	563	317	1,473	426	325	220	363	326	1,472	904	852
SPEC. COND., LAB	743	μmhos/cm	266	835	462	581	1,370	504	435	372	538	282	1,390	374	281	179	340	308	1,390	899	802
SULFATE	69.9	mg/L	10.8	60.9	31.5	30.8	69.7	39.8	15.3	2.8	25.1	6.1	31.5	25.8	42.1	< 2.0	6.4	12.9	45.1	78.8	24.8
ALKALINITY	140	mg/L	< 5	47	15	30	75	24	63	23	26	10	109	18	68	68	42	14	192	44	28
TDS (TOTAL DISSOLVED SOLIDS)	387	mg/L	222	596	272	432	936	330	282	230	400	166	712	152	150	90	242	194	830	634	390
TOC (TOTAL ORGANIC CARBON)	1.33	mg/L	0.53	1.5	1.3	1.1	2.6	0.86	1.3	0.74	1.3	< 0.50	0.81	6.9	< 0.50	< 0.50	< 0.50	0.82	1.0	1.1	0.93
TOTAL PHENOLICS	0.005*	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	0.006	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
TURBIDITY	4.60	NTU	0.22	0.12	0.22	0.12	0.28	0.18	0.23	0.26	0.24	0.29	5.50	47.6	11.9	105	3.69	0.13	0.46	0.71	0.91
BENZENE	1.0*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-DIBROMOETHANE (EDB)	1.0*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-DICHLOROETHANE	1.0*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-DICHLOROETHENE	1.0*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-DICHLOROETHANE	1.0*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-DICHLOROETHENE	1.0*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans 1,2-DICHLOROETHENE	1.0*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ETHYLBENZENE	1.0*	$\mu g/L$	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
METHYLENE CHLORIDE	1.0*	$\mu g/L$	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TETRACHLOROETHENE	1.0*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TOLUENE	1.0*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-TRICHLOROETHANE	1.0*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TRICHLOROETHENE	1.0*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
VINYL CHLORIDE	1.0*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
XYLENES (TOTAL)	3.0*	μg/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

Notes:

Gray text indicates a parameter non-detection.

Shaded text indicates a background standard exceedance.

^{*} Reporting limit substituted for background standard due to lack of historical detections in the upgradient well.

^{**} One-sided background standards are not appropriate for pH. Other analysis used in report.

Table 2. LCSWMA Frey Farm Landfill Form 52 Groundwater Monitoring Well Background Standard Comparisons - 3rd Quarter 2020

Parameter	FFLF Background Standard	Units	3044 RIVER RD	3052 RIVER RD	3056 RIVER RD	3060 RIVER RD	3076 RIVER RD	3079 RIVER RD	3088 RIVER RD	3100 RIVER RD	3106 RIVER RD	3125 RIVER RD
ALKALINITY, TOTAL	140	mg/L	6	6			6	32	168	11	12	124
BICARBONATE	132	mg/L	6	6			6	32	168	11	12	124
CALCIUM, DISSOLVED	79.4	mg/L	13.7	16.6	11.6	11	14.7	10.5	0.14	14.5	22.2	0.28
CALCIUM, TOTAL	72.5	mg/L	13.4	16.4	11.5	10.8	14.2	10.3	0.16	14.0	21.4	0.30
CHLORIDE	30.9	mg/L	20.8	21.2	26.7	21.0	48.8	32.7	222	41.8	109	85.0
COD (CHEMICAL OXYGEN DEMAND)	15*	mg/L				23	22	22	22	23	24	21
IRON, TOTAL	0.70	mg/L		0.040							0.052	
MAGNESIUM, DISSOLVED	10.9	mg/L	10.8	9.0	13.7	11.9	8.9	5.7		6.4	14.9	
MAGNESIUM, TOTAL	10.3	mg/L	10.7	8.8	13.6	11.6	8.5	5.6	0.055	6.2	14.6	0.056
MANGANESE, DISSOLVED	0.53	mg/L	0.029	0.037	0.10	0.11	0.18	0.12		0.0082	0.045	
MANGANESE, TOTAL	0.47	mg/L	0.030	0.037	0.10	0.11	0.18	0.12		0.0081	0.044	
NITRATE-NITROGEN	28.6	mg/L	18.3	17.6	22.6	16.2	9.8		5.7	4.7	10.8	4.7
pH-FIELD	None**	S.U.	4.86	4.89	3.74	4.09	4.90	5.38	6.33	5.09	5.24	6.16
pH-LAB	None**	S.U.	5.61	5.59	4.03	4.54	5.52	6.13	6.94	5.64	6.04	6.89
POTASSIUM, DISSOLVED	11.4	mg/L	1.7	2.0	2.3	2.6	3.5	2.1	2.8	1.6	2.3	2.0
POTASSIUM, TOTAL	13.4	mg/L	1.9	2.0	2.5	2.7	3.6	2.2	3.1	1.6	2.3	2.3
SODIUM, DISSOLVED	21.6	mg/L	9.1	8.2	9.2	9.0	25.3	14.6	226	16.9	46.2	125.0
SODIUM, TOTAL	26.5	mg/L	8.9	7.9	8.9	8.5	23.8	14.2	209	16.2	43.4	120.0
SPEC. COND., FIELD	636	μmhos/cm	282	259	322	264	328	207	328	259	452	554
SPEC. COND., LAB	743	μmhos/cm	230	218	277	226	284	192	1,010	216	469	563
SULFATE	69.9	mg/L		2.3		9.8	11.1	10.8	8.4	8.7	5.6	9.8
TDS (TOT. DISSOLVED SOLIDS)	387	mg/L	180	170	202	152	182	150	522	162	296	300
TOC (TOTAL ORGANIC CARBON)	1.33	mg/L										0.61
TOTAL ORGANIC HALOGEN	20.0*	μg/L					20.1					
TOTAL PHENOLICS	0.005*	mg/L	0.005	0.005				0.005	0.006	0.005		
TURBIDITY	4.60	NTU		0.69	0.14	0.14	0.23	0.19	0.23	0.15	0.29	0.16

Notes:

Gray text indicates a parameter non-detection.

Shaded text indicates a background standard exceedance.

^{*} Reporting limit substituted for background standard due to lack of historical detections in the upgradient well.

^{**} One-sided background standards are not appropriate for pH. Other analysis used in report.

ATTACHMENT 1 BACKGROUND UPPER PREDICTION LIMITS



LCSWMA FREY FARM LANDFILL 3rd Quarter 2020 - Background Upper Prediction Limits (FFMP002W) Form 19 Quarterly Parameters **Parameter** Distribution **Upper Prediction Limit** Unit AMMONIA-NITROGEN Normal 0.303 mg/L **BICARBONATE** No Distribution 132 mg/L CALCIUM, TOTAL No Distribution 72.5 mg/L CALCIUM, DISSOLVED No Distribution 79.4 mg/L COD (CHEMICAL OXYGEN DEMAND) 15* mg/L NA CHLORIDE Normal 30.9 mg/L FLUORIDE No Distribution 0.50 mg/L IRON, TOTAL No Distribution 0.70 mg/L IRON, DISSOLVED NA 0.056* mg/L MAGNESIUM, TOTAL No Distribution 10.3 mg/L MAGNESIUM, DISSOLVED Normal 10.9 mg/L MANGANESE, TOTAL No Distribution 0.47 mg/L MANGANESE, DISSOLVED Lognormal 0.53 mg/L NITRATE-NITROGEN No Distribution 28.6 mg/L pH-FIELD NA None** S.U. None** pH-LAB NA S.U. POTASSIUM, TOTAL 13.4 No Distribution mg/L POTASSIUM, DISSOLVED No Distribution 11.4 mg/L SODIUM, TOTAL No Distribution 26.5 mg/L SODIUM, DISSOLVED Normal 21.6 mg/L SPEC. COND., FIELD No Distribution 636 µmhos/cm SPEC. COND., LAB No Distribution 743 μmhos/cm SULFATE No Distribution 69.9 mg/L TOTAL ALKALINITY No Distribution 140 mg/L TDS (TOTAL DISSOLVED SOLIDS) 387 Lognormal mg/L TOC (TOTAL ORGANIC CARBON) Normal 1.33 mg/L TOTAL PHENOLICS 0.005* NA mg/L TURBIDITY No Distribution 4.60 NTU BENZENE NΑ 1.0* μg/L 1,2-DIBROMOETHANE NA 1.0* μg/L 1,1-DICHLOROETHANE 1.0* μg/L NA 1,1-DICHLOROETHENE 1.0* μg/L NA 1,2-DICHLOROETHANE NA 1.0* μg/L 1.0* μg/L cis 1,2-DICHLOROETHENE NA trans 1,2-DICHLOROETHENE NA 1.0* μg/L ETHYLBENZENE NA 1.0* μg/L METHYLENE CHLORIDE 1.0* μg/L NA TETRACHLOROETHENE NA 1.0* μg/L TOLUENE NA 1.0* μg/L 1,1,1-TRICHLOROETHANE NA 1.0* μg/L TRICHLOROETHENE NA 1.0* μg/L VINYL CHLORIDE NA 1.0* μg/L XYLENES (TOTAL) NA 3.0* μg/L

Notes:

[&]quot;NA" denotes parameter not detected or not enough detections in upgradient well over course of historical data to develop tolerance limits.

^{*} Reporting limit substituted for background standard due to lack of historical detections.

^{**} One-sided background standards are not appropriate for pH. Other analysis used in report.

ATTACHMENT 2 STATISTICAL CALCULATION SHEETS



	Α	В	С	D	E	F	G	Н	I	J	K	L
1				Background	Statistics for	Data Sets v	with Non-Dete	ects				
2			cted Options									
3	Dat	te/Time of C	•		11/24/2020 4							
4			From File		ProUCL Inpo	ut 20Q3.xls						
5			II Precision	OFF								
6		Confidence		95%								
7			Coverage	95%								
8		Future K Ob		1								
9	Number o	of Bootstrap	Operations	2000								
10	AMMONIIA	NITROGEN										
11	AMMONIA-	MITROGEN										
12						General	Statistics					
13			Total	Number of C	bservations	47			Numbe	er of Missing	Observations	0
14				r of Distinct C		7					0000.100	
15					er of Detects	7				Number of	Non-Detects	40
16			N	umber of Dist		7			Numb		Non-Detects	1
17					mum Detect	0.1					n Non-Detect	0.1
18					mum Detect	0.63					n Non-Detect	0.1
19					ce Detected	0.0395					Non-Detects	85.11%
20					an Detected	0.304					SD Detected	0.199
21			Mean	of Detected L		-1.389			SD		Logged Data	0.699
22					33						33	
23				Criti	cal Values fo	r Backgrour	nd Threshold	Values (BT	Vs)			
24 25			Tole	rance Factor		2.074		`	<u>, </u>	d2r	nax (for USL)	2.933
26					, ,						, ,	
27					Norm	al GOF Tes	t on Detects	Only				
28			S	hapiro Wilk T	est Statistic	0.904			Shapiro W	ilk GOF Test		
29			5% S	hapiro Wilk C	ritical Value	0.803	De	tected Data	appear No	rmal at 5% Si	gnificance Le	/el
30				Lilliefors T	est Statistic	0.254			Lilliefors	GOF Test		
31			5	% Lilliefors C	ritical Value	0.304	De	tected Data	appear No	rmal at 5% S	gnificance Lev	/el
32				Det	ected Data a	ppear Norm	al at 5% Sigr	nificance Le	vel			
33												
34				Kaplan Mei	er (KM) Back	ground Stat	stics Assumi	ng Normal D	Distribution			
35					KM Mean	0.13					KM SD	0.102
36				95% UTL95	ŭ	0.341					% KM UPL (t)	0.303
37					ercentile (z)	0.261					Percentile (z)	0.298
38				99% KM P	ercentile (z)	0.367					95% KM USL	0.429
39												
40				DL/2 Subst	itution Backg		stics Assumin	ng Normal D	istribution			
41				050/ 155	Mean	0.0879					SD SD	0.116
42				95% UTL95	_	0.329					95% UPL (t)	0.285
43					ercentile (z)	0.237				95%	Percentile (z)	0.279
44			B. (2.)		ercentile (z)	0.358	11.26		40.00		95% USL	0.429
45			UL/2 is r	not a recomm	enaed metho	oa. DL/2 pro	vided for com	iparisons an	a nistorical	reasons		
46					emms COE	Toots are D	tootod Ot-	evetices O: !				
47					amma GOF		lected Obser		•	uding OOF T		
48					est Statistic	0.319	D-4			arling GOF Te		00 500
49					critical Value	0.713	Detected				5% Significan	ce Level
50				K-S T	est Statistic	0.212		· · · · · · · · · · · · · · · · · · ·	\oimogorov	-Smirnov GC	'r	

					- IZ	
E1	A B C D 5% K-S C	E ritical Value	0.314	G H I J Detected data appear Gamma Distributed at 5%	K Significan	ce Level
51 52			Gamma Dis	tributed at 5% Significance Level		
		•••				
53		Gamma	Statistics on	Detected Data Only		
54 55		k hat (MLE)	2.665	k star (bias correc	ted MLE)	1.618
56		a hat (MLE)	0.114	Theta star (bias correc	,	0.188
	n	u hat (MLE)	37.3	nu star (bias c	corrected)	22.65
57 58	MLE Mean (bia	s corrected)	0.304	<u> </u>	-	
59	MLE Sd (bia	s corrected)	0.239	95% Percentile of Chisquar	e (2kstar)	8.22
60						
61	G	amma ROS	Statistics us	ing Imputed Non-Detects		
62	GROS may not be used	when data so	et has > 50%	NDs with many tied observations at multiple DLs		
63	GROS may not be used when kstar of	of detects is s	small such a	s <1.0, especially when the sample size is small (e.g	., <15-20)	
64	For such situation	ons, GROS r	nethod may	yield incorrect values of UCLs and BTVs		
65	Т	his is especia	ally true whe	n the sample size is small.		
66	For gamma distributed detected of	data, BTVs a	nd UCLs ma	ay be computed using gamma distribution on KM esti	mates	
67		Minimum	0.01		Mean	0.0538
68		Maximum	0.63		Median	0.01
69		SD	0.128		CV	2.377
70		k hat (MLE)	0.524	k star (bias correc	ted MLE)	0.504
71	Thet	a hat (MLE)	0.103	Theta star (bias correct	ted MLE)	0.107
72	n	u hat (MLE)	49.23	nu star (bias o	corrected)	47.42
73	MLE Mean (bia	s corrected)	0.0538	MLE Sd (bias o	corrected)	0.0758
74	95% Percentile of Chisqu	are (2kstar)	3.863	90% F	Percentile	0.145
75	95%	6 Percentile	0.206	99% P	ercentile	0.355
76	The following statis	stics are com	puted using	Gamma ROS Statistics on Imputed Data		
77	Upper Limits u) and Hawkins Wixley (HW) Methods		
78		WH	HW		WH	HW
79	95% Approx. Gamma UTL with 95% Coverage	0.236	0.224	95% Approx. Gamma UPL	0.172	0.159
80	95% Gamma USL	0.436	0.447			
81						
82	Es			neters using KM Estimates		
83		Mean (KM)	0.13		SD (KM)	0.102
84	Va	riance (KM)	0.0103		ean (KM)	0.016
85		k hat (KM)	1.646		star (KM)	1.556
86		nu hat (KM)	154.8		star (KM)	146.2
87		eta hat (KM)	0.0792		star (KM)	0.0838
88	80% gamma per	, ,	0.201	90% gamma perce	` ′	0.269
89	95% gamma per	centile (KM)	0.336	99% gamma perce	ntile (KM)	0.485
90	The fallender of	tiotics are a	mama standara * -	a appropriately the and I/M astimuses		
91	-		=	g gamma distribution and KM estimates		
92	Upper Limits t	WH	Hilferty (WH) and Hawkins Wixley (HW) Methods	WL	L1/A/
93	95% Approx. Gamma UTL with 95% Coverage	0.292	0.286	95% Approx. Gamma UPL	WH 0.253	HW 0.247
94	95% Approx. Gamma OTE with 95% Coverage 95% KM Gamma Percentile	0.292	0.242	95% Approx. Gamma UPL 95% Gamma USL	0.253	0.247
95	95 % NW Gamma Percentile	U.Z40	0.242	95% Gaillilla USL	0.387	0.383
96	Lo	anormal CO	F Taet on Da	etected Observations Only		
97	Shapiro Wilk T	<u> </u>	0.935	Shapiro Wilk GOF Test		
98	5% Shapiro Wilk C		0.935	Detected Data appear Lognormal at 5% Sign	nificanco I	evel
99	<u> </u>	est Statistic	0.803	Lilliefors GOF Test	micarice L	vei
100	Lilletors I	ธ อเ อเสแรแต	0.19	Lillerors GOF Test		

	A B C D E	F	GHIJK	ı
101	5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Le	evel
102	Detected Data ap	pear Lognor	rmal at 5% Significance Level	
103				
104	Background Lognormal ROS Statistics	Assuming L	ognormal Distribution Using Imputed Non-Detects	
105	Mean in Original Scale	0.0601	Mean in Log Scale	-4.377
106	SD in Original Scale	0.127	SD in Log Scale	1.894
107	95% UTL95% Coverage	0.638	95% BCA UTL95% Coverage	0.564
108	95% Bootstrap (%) UTL95% Coverage	0.564	95% UPL (t)	0.312
109	90% Percentile (z)	0.142	95% Percentile (z)	0.283
110	99% Percentile (z)	1.029	95% USL	3.245
111			1	
112	Statistics using KM estimates of	on Logged D	ata and Assuming Lognormal Distribution	
113	KM Mean of Logged Data	-2.167	95% KM UTL (Lognormal)95% Coverage	0.268
114	KM SD of Logged Data	0.41	95% KM UPL (Lognormal)	0.23
115	95% KM Percentile Lognormal (z)	0.225	95% KM USL (Lognormal)	0.381
116		I		
117	Background DL/2 S	Statistics Ass	suming Lognormal Distribution	
118	Mean in Original Scale	0.0879	Mean in Log Scale	-2.756
119	SD in Original Scale	0.116	SD in Log Scale	0.631
120	95% UTL95% Coverage	0.235	95% UPL (t)	0.185
121	90% Percentile (z)	0.143	95% Percentile (z)	0.179
122	99% Percentile (z)	0.276	95% USL	0.404
123	DL/2 is not a Recommended Metho	od. DL/2 pro	vided for comparisons and historical reasons.	
124				
125	-		Free Background Statistics	
126	Data appear to follow a D	Discernible D	Distribution at 5% Significance Level	
127				
128	Nonparametric Upper Limits for BT		ction made between detects and nondetects)	
I I				
129	Order of Statistic, r	46	95% UTL with95% Coverage	0.46
129 130	Approx, f used to compute achieved CC	1.211	Approximate Actual Confidence Coefficient achieved by UTL	0.688
	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC	1.211	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL	0.688 0.44
130	Approx, f used to compute achieved CC	1.211	Approximate Actual Confidence Coefficient achieved by UTL	0.688
130 131	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL	1.211 93 0.63	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL	0.688 0.44
130 131 132	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservation	1.211 93 0.63	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20.	0.688 0.44
130 131 132 133	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservation Therefore, one may use USL to estimate a BTV	1.211 93 0.63 ive estimate only when t	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers	0.688 0.44
130 131 132 133 134	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservation Therefore, one may use USL to estimate a BTV and consists of observa	1.211 93 0.63 ive estimate only when the ations collected	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers red from clean unimpacted locations.	0.688 0.44
130 131 132 133 134 135	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa	1.211 93 0.63 ive estimate only when the ations collections between	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. the data set represents a background data set free of outliers are from clean unimpacted locations. If also positives and false negatives provided the data	0.688 0.44
130 131 132 133 134 135 136	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa	1.211 93 0.63 ive estimate only when the ations collections between	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers red from clean unimpacted locations.	0.688 0.44
130 131 132 133 134 135 136 137 138	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w	1.211 93 0.63 ive estimate only when the ations collections between	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. the data set represents a background data set free of outliers are from clean unimpacted locations. If also positives and false negatives provided the data	0.688 0.44
130 131 132 133 134 135 136 137 138	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa	1.211 93 0.63 ive estimate only when the ations collections between	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. the data set represents a background data set free of outliers are from clean unimpacted locations. If also positives and false negatives provided the data	0.688 0.44
130 131 132 133 134 135 136 137 138	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w	1.211 93 0.63 ive estimate only when tations collectince between then many or	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. the data set represents a background data set free of outliers seed from clean unimpacted locations. If alse positives and false negatives provided the data insite observations need to be compared with the BTV.	0.688 0.44
130 131 132 133 134 135 136 137 138 139	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w BICARBONATE	1.211 93 0.63 ive estimate only when the ations collectince between then many or General	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. the data set represents a background data set free of outliers are from clean unimpacted locations. If also positives and false negatives provided the data ansite observations need to be compared with the BTV. Statistics	0.688 0.44 0.578
130 131 132 133 134 135 136 137 138 139 140	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservation of Consists of Observations Therefore, one may use USL to estimate a BTV and consists of Observations The use of USL tends to provide a balar represents a background data set and w BICARBONATE Total Number of Observations	1.211 93 0.63 ive estimate only when tations collectince between then many of General 47	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. the data set represents a background data set free of outliers seed from clean unimpacted locations. If alse positives and false negatives provided the data insite observations need to be compared with the BTV.	0.688 0.44
130 131 132 133 134 135 136 137 138 139 140 141	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w BICARBONATE Total Number of Observations Number of Distinct Observations	1.211 93 0.63 ive estimate only when the ations collecting between then many or General 47 14	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. the data set represents a background data set free of outliers and false positives and false negatives provided the data ansite observations need to be compared with the BTV. Statistics Number of Missing Observations	0.688 0.44 0.578
130 131 132 133 134 135 136 137 138 139 140 141 142 143	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservation of Distinct Observations Number of Distinct Observations Number of Detects	1.211 93 0.63 ive estimate only when tations collectince between then many or serious desired at the serious collectince between then many or serious desired at the serious collectince between the serious collectince between the serious collecting at t	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers red from clean unimpacted locations. false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects	0.688 0.44 0.578 0
130 131 132 133 134 135 136 137 138 139 140 141 142 143 144	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w BICARBONATE Total Number of Observations Number of Distinct Observations Number of Detects Number of Distinct Detects	1.211 93 0.63 ive estimate only when the stions collectince between then many or state of the street of the stree	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. the data set represents a background data set free of outliers sted from clean unimpacted locations. If alse positives and false negatives provided the data insite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Distinct Non-Detects Number of Distinct Non-Detects	0.688 0.44 0.578 0
130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservation of Distinct Detects Note: The use of USL tends to provide a balar represents a background data set and w BICARBONATE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect	1.211 93 0.63 ive estimate only when the stions collectince between then many of the street of the street only when the street only whe	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. The data set represents a background data set free of outliers are from clean unimpacted locations. If alse positives and false negatives provided the data ansite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect	0.688 0.44 0.578 0 27 1 5
130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservation of Distinct Detects Note: The use of USL tends to provide a balar of Distinct Detects Number of Distinct Detects Maximum Detect	1.211 93 0.63 ive estimate only when the stions collectince between then many or state of the street of the stree	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. the data set represents a background data set free of outliers ted from clean unimpacted locations. If alse positives and false negatives provided the data insite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Maximum Non-Detect	0.688 0.44 0.578 0 27 1 5 5
130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147	Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservation of Distinct Detects Note: The use of USL tends to provide a balar represents a background data set and w BICARBONATE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect	1.211 93 0.63 ive estimate only when the stions collectince between then many or state of the street of the stree	Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. The data set represents a background data set free of outliers are from clean unimpacted locations. If alse positives and false negatives provided the data ansite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect	0.688 0.44 0.578 0 27 1 5

	ΛΙ	ΒΙ		Г			F	<u> </u>	ш	ı		$\overline{}$	1		_K T	1
151	Α	В	C Mean o	D of Detected		E ed Data	2.823	G	<u> </u>		S	D of I	J Detected		K d Data	1.241
152																
153				Cr	ritical V	alues fo	r Backgrou	nd Threshol	d Values ((BTVs)						
154			Toler	ance Facto	or K (Fc	or UTL)	2.074						d2ı	max (fo	r USL)	2.933
155																
156						Norma	al GOF Tes	t on Detects	s Only							-
157			SI	hapiro Wilk	Test S	Statistic	0.673			Sh	apiro \	Wilk C	OF Tes	t		
158			5% St	napiro Wilk	Critical	l Value	0.905		Data	Not No	ormal a	at 5%	Significa	ance Le	evel	-
159				Lilliefors	Test S	Statistic	0.268			l	Lilliefo	rs GC	F Test			
160			59	% Lilliefors	Critical	l Value	0.192		Data	Not No	ormal a	at 5%	Significa	ance Le	evel	
161					Di	ata Not	Normal at 5	% Significa	nce Level							
162																
163				Kaplan Me	eier (KN	VI) Back	ground Stat	istics Assur	ning Norm	al Distr	ibutior	1				
164					KM	/I Mean	18.47							ŀ	KM SD	36.13
165				95% UTL9	95% Co	verage	93.41						95	% KM l	JPL (t)	79.77
166				90% KM	Percer	ntile (z)	64.78						95% KM	Percer	ntile (z)	77.9
167				99% KM	Percer	ntile (z)	102.5							95% KI	M USL	124.4
168																
169				DL/2 Sub	stitutio	n Backg	round Stati	stics Assum	ing Norma	al Distril	bution					
170						Mean	17.03								SD	37.08
171			-	95% UTL9	5% Co	verage	93.94							95% l	JPL (t)	79.94
172				90%	Percer	ntile (z)	64.56						95%	Percen	ntile (z)	78.03
173				99%	Percer	ntile (z)	103.3							959	% USL	125.8
174			DL/2 is n	ot a recom	mende	d metho	d. DL/2 pro	vided for co	mparisons	s and hi	istorica	al reas	sons			
175																
176					Gamm	a GOF	Tests on De	etected Obs	ervations (Only		-				
177				A-D	Test S	Statistic	1.343			Ande	rson-C	Darling	GOF T	est		
178				5% A-D	Critical	l Value	0.779	I	Data Not G	Gamma	Distrib	outed	at 5% Si	ignifica	nce Lev	el
179				K-S	Test S	Statistic	0.251			Koln	nogoro	v-Sm	irnov GC)F		
180				5% K-S	Critical	l Value	0.201		Data Not G	Gamma	Distrib	outed	at 5% S	ignifica	nce Lev	el
181				D)ata No	t Gamm	na Distribute	ed at 5% Sig	gnificance	Level						
182																
183					G	amma (Statistics or	Detected D	Data Only							
184					k hat	t (MLE)	0.767					k star	r (bias co	orrected	MLE)	0.685
185				Th	neta hat	(MLE)	47.81				Thet	ta sta	r (bias co	orrected	MLE)	53.51
186					nu hat	t (MLE)	30.66					n	u star (b	ias corr	rected)	27.4
187				E Mean (b		- 1	36.65									
188				MLE Sd (b	ias com	rected)	44.28			959	% Perc	centile	of Chise	quare (2	2kstar)	4.699
189																
190								sing Impute								
191			•					% NDs with	•							
192		GROS may n												(e.g., <	15-20)	
193			For				•				Ls and	BTV	3			
194							•	en the samp								
195		For gamn	na distribut	ed detected				ay be comp	uted using	gamm	a distr	ibutio	n on KM	estima	tes	
196					Mi	inimum	0.01								Mean	15.6
197					Ma	ximum	182						/ledian	0.01		
198		·				SD	37.67			-		CV	2.415			
199					k hat	t (MLE)	0.179 87.33						r (bias co		-	0.181 85.99
193 194 195 196 197		For gamn			This is d data,	BTVs and inimum aximum	ally true who nd UCLs m	y yield incomen the samp	ole size is s	small.					Mean /ledian	0.01

	^							1 11		1 1	1/	
201	A	В	С	D	E nu hat (MLE)	F 16.79	G	Н	<u> </u>	J nu star (bia	K s corrected)	17.05
202			М	LE Mean (bia	as corrected)	15.6				MLE Sd (bia	s corrected)	36.63
203			95% Percer	ntile of Chisq	uare (2kstar)	1.916				909	% Percentile	47.07
204				95	% Percentile	82.38				99%	6 Percentile	181.2
205			The f	ollowing stat	istics are con	nputed using	Gamma RO	OS Statistics	on Imputed	Data		
206			ι	Jpper Limits	using Wilson	Hilferty (WF	l) and Hawk	ins Wixley (H	IW) Method:	S		
207					WH	HW					WH	HW
208	95% App	rox. Gamma	UTL with 95	5% Coverage	89.78	103.2		9	5% Approx.	Gamma UPL	59.4	61.9
209			95%	Gamma USL	193.9	271.1						
210					II.	1	1					
211				Es	timates of G		neters using	KM Estimat	es			
212					Mean (KM)						SD (KM)	36.13
213				Va	ariance (KM)					SE of	f Mean (KM)	5.408
214					k hat (KM)						k star (KM)	0.259
215					nu hat (KM)	24.55					nu star (KM)	24.32
216					eta hat (KM)						eta star (KM)	71.38
217				% gamma pe						% gamma per		55.29
218			95%	% gamma pe	rcentile (KM)	88.48			99	% gamma per	centile (KM)	176.4
219												
220				following sta								
221				Jpper Limits			i) and Hawk	ins Wixley (F	IW) Method:	S	1471.1	1.004
222	0E0/ A		المالية التالية	-0/ Cavara	WH	HW		0	E0/ Amaza	Camana LIDI	WH	HW
223	95% App			5% Coverage na Percentile		71.03 50.62		9	• • • • • • • • • • • • • • • • • • • •	Gamma UPL Gamma USL	55.63 126.3	52.8 129.8
224		95	% KW Gallin	na Percentile	55.47	50.02			95%	Gamma USL	120.3	129.0
225				1.0	ognormal GO	F Test on D	etected Ohe	en/ations On	h			
226			S	Shapiro Wilk				ervauoris Ori	•	ilk GOF Test		
227				hapiro Wilk (Data Not	•	at 5% Significa	ance I evel	
228					Test Statistic			- Data Hot	•	GOF Test		
229			5	% Lilliefors C				Data Not		at 5% Significa	ance Level	
230						ognormal at	5% Significa					
231												
233		E	Background L	ognormal R	OS Statistics	Assuming L	ognormal Di	stribution Us	ing Imputed	Non-Detects		
234				Mean in O	riginal Scale	16.05				Mean i	in Log Scale	0.681
235				SD in O	riginal Scale	37.49				SD i	in Log Scale	2.285
236				95% UTL95	% Coverage	225.9			95%	6 BCA UTL95	% Coverage	157.4
237		S	95% Bootstra	p (%) UTL95	% Coverage	173.6					95% UPL (t)	95.34
238				90% F	Percentile (z)	36.94				95% P	ercentile (z)	84.74
239				99% F	Percentile (z)	402.2					95% USL	1607
240							1					
241			Statis	stics using KI	/I estimates	on Logged D	ata and Ass	uming Logno	rmal Distrib	ution		
242				KM Mean of				959	,	Lognormal)95	•	65.46
243					ogged Data					95% KM UPL	`	45.03
244			95% KM	Percentile L	ognormal (z)	42.79				95% KM USL	(Lognormal)	153.4
245												
246					round DL/2		suming Logr	ormal Distril	oution			
247					riginal Scale						in Log Scale	1.728
248					riginal Scale						in Log Scale	1.243
249					% Coverage						95% UPL (t)	46.32
250				90% F	Percentile (z)	27.66				95% P	ercentile (z)	43.45
									_			

	-	_	-				T =	_	1								
251	A	В	С	9		E rcentile (z	F 2) 101.3	G	ŀ	1	<u> </u>		J		95% USL	L 215.2	
251 252			DL/2 is			•	′∣ hod. DL/2 pr	ovided for	compariso	ns an	d histori	cal r	easons.				
							<u> </u>		<u> </u>								
253					Non	parametri	c Distribution	Free Bac	ckaround S	tatisti	cs						
254						•	follow a Disc										
255										. ,							
256			Nonpar	ametric l	Jpper L	imits for E	BTVs(no disti	nction ma	de betwee	n dete	ects and	nonc	detects)				
257			•			Statistic,	<u> </u>						-	th95%	Coverage	154	
258		A	pprox, f use	d to com	pute ac	hieved C	C 1.211	Approx	kimate Actu	ıal Co					•		38
259 260	Approxin	nate Sample	e Size need	ed to ach	nieve sp	ecified C	C 93								95% UPL		
261						95% US	L 182					ç	95% KM	Cheby	/shev UPL	. 177.6	
262																	
263		Note: The	use of USL	tends to	yield a	conserva	ative estimat	e of BTV,	especially	when	the sam	ple s	ize start	s exce	eding 20.		
264		Therefore	e, one may i	use USL	to estir	nate a BT	V only when	the data	set represe	nts a	backgro	und o	data set	free o	f outliers		
265				and o	consists	of obser	vations colle	cted from	clean unim	pacte	d location	ns.					
266		1	he use of U	SL tends	s to pro	vide a bal	ance betwee	n false po	sitives and	false	negative	es pr	ovided t	he dat	а		
267		re	presents a	backgrou	ınd data	a set and	when many	onsite obs	ervations r	need t	o be con	npare	ed with t	he BT	V.		
268																	
269	CALCIUM,	TOTAL															
270																	
271	General Sta	tistics															
272			Tota	al Numbe	er of Ob	servation	s 46				Nui	mber	of Disti	nct Ob	servations	40	
273											Nur	nber	of Missi	ing Ob	servations	1	
274						Minimur	n 18.4							Fir	st Quartile	20.83	3
275					Seco	nd Larges	st 74.7								Median	23.1	
276						Maximur	n 93							Thi	rd Quartile	24.8	5
277						Mea	n 27.46								SD	15.03	3
278				Coef	ficient o	of Variatio	n 0.547								Skewness	3.17	73
279				Ме	an of lo	gged Dat	a 3.231						SI	D of lo	gged Data	0.35	6
280							"									·I	
281					Critic	al Values	for Backgrou	ınd Thres	hold Value	s (BT\	√s)						
282			Tol	erance F	actor K	(For UTL	.) 2.079							d2max	k (for USL)	2.92	24
283								-								.1	
284							Normal	GOF Tes	t								
285				Shapiro	Wilk Te	est Statisti	c 0.533				Shapiro	o Will	k GOF T	Test .			
286			5%	Shapiro \	Wilk Cr	itical Valu	e 0.945		Da	ata No	t Norma	l at 5	5% Signi	ificanc	e Level		
287						st Statisti					Lillie	fors (GOF Tes	st			
288				5% Lillie	fors Cr	itical Valu	e 0.129		Da	ata No	t Norma	l at 5	5% Signi	ificanc	e Level		
289						Data N	ot Normal at	5% Signif	icance Lev	el							
290																	
291							Statistics As	suming No	ormal Distr	ibutio	n						
292			95%	UTL wit		Coverag									rcentile (z)		
293					9.	5% UPL (<i>'</i>								rcentile (z)		
294						95% USI	71.41						99	9% Pe	rcentile (z)	62.43	3
295																	
296								GOF Tes									
297						est Statisti					son-Dar						
298				5%	A-D Cri	itical Valu									ficance Le	vel	
299						st Statisti					orov-Sm						
300				5%	K-S Cri	itical Valu	e 0.131		Data No	t Gam	ıma Dist	ribute	ed at 5%	signi	ficance Le	vel	

	А	В	С		D		E I	F	G	Н	I	1	l J	1	K	
301		ם	1 0		ט			-	ed at 5% Sign		evel	1	J		r\	
302																
303								Gamma	Statistics							
304						k hat ((MLE)	6.269				k:	star (bias o	correc	ted MLE)	5.875
305					7	Theta hat	(MLE)	4.381				Theta	star (bias	correc	ted MLE)	4.675
306						nu hat	(MLE)	576.8					nu star (bias c	orrected)	540.5
307				MLE	Mean	(bias corre	ected)	27.46					MLE Sd (bias c	orrected)	11.33
308							l.									1
309						Backgro	und Sta	atistics Ass	uming Gamm	a Distribut	tion					
310		95% Wil	son Hilferty	y (WH) Appro	x. Gamma	a UPL	48.36					!	90% F	Percentile	42.61
311			kins Wixley	•				47.82					!	95% F	Percentile	48.36
312	95	5% WH App	orox. Gamr	ma UT	L with	95% Cov	/erage	54.76					!	99% F	Percentile	60.41
313	95	5% HW App	orox. Gamr	ma UT	L with	95% Cov	/erage	54.3								
314						95% WF	H USL	70.88						95%	HW USL	70.97
315																
316									I GOF Test							
317					•	ilk Test St		0.683			-	_	normal G			
318			59	% Sha		lk Critical		0.945			•		nt 5% Signi		e Level	
319						rs Test St		0.279				_	ormal GOF			
320				5%	Lilliefor	rs Critical		0.129				ormal a	nt 5% Signi	ficano	e Level	
321						Data	Not Lo	ognormal at	5% Significa	nce Level						
322																
323									ning Lognorn	nal Distribu	ution					
324			95	5% UT	L with	95% Cov	•	53							centile (z)	
325						95% U	` ,	46.27							centile (z)	45.42
326						95%	6 USL	71.57					99%	6 Perc	centile (z)	57.87
327																
328									Free Backgro							
329						Data de	o not fo	ollow a Disc	ernible Distrib	oution (0.0	5)					
330																
331									Background	Ihreshold	i Value		user su	050/		
332						ler of Stat		45					UTL with			
333		<i></i>	Approx, f u	sed to	compu	ite achieve	ed CC	1.184	Approxima							0.677
334		F0/ D	5			250/ 0		00.40	Approxim	-			d to achiev	-		
335	9:	5% Percent	tile Bootstr	ap U I	L with		-	88.43		95% B	CA Boo	otstrap	UTL with			
336					000/ 6		6 UPL	72.46							Percentile	
337						Chebyshe		73.04							Percentile	-
338					95% (Chebyshe		93.68						99% F	Percentile	84.76
339						95%	6 USL	93								
340		Note: T	auca - £11	CI +-	do to : '	old =	000*	un national	of DTV/	ololler et	- als a	omeni-	olao etera		din = 00	
341									of BTV, espe	•					_	
342		ı neretoi	ie, one ma	•					he data set re	•			uata set f	iee of	outliers	
343			The use of						ted from clear				rovidod #-	o data		
344						•			false positive		_					
345		r	epresents	a paci	kground	ı uata set	and Wh	ien many o	nsite observa	uons need	u to be	compar	ea with the	FRIA	•	
346	CALCULA	חופפטי ער	.n													
347	CALCIUM,	PIOOULVE	ט													
348	General Sta	atiotico														
349	General Sta	ausucs		otal N	umbaa	of Observ	otions	12				Ni imbe e	r of Distir	→	on/oti	11
350			- 1	บเสเ N	umber (of Observ	auons	12				edilline	r of Distino	i ODS	ervations	11

_	^	l 5				Т	_	_		T 11		
351	Α	В	С		D		E	F	G	Н	I J K Number of Missing Observations	34
352						N	Minimum	18.3			First Quartile	20.73
353					S	econd	d Largest	26.6			Median	23.4
						N	1aximum	79.4			Third Quartile	24.9
354 355							Mean	27.18			SD	16.69
356				(Coefficie	ent of \	Variation	0.614			Skewness	3.285
357					Mean	of logg	ged Data	3.208			SD of logged Data	0.389
358												
359					С	ritical	Values fo	or Backgroui	nd Threshol	d Values (BT	Vs)	
360			Te	olerar	ice Facto	or K (I	For UTL)	2.736			d2max (for USL)	2.285
361												
362								Normal (GOF Test			
363				Sha	piro Will	k Test	Statistic	0.487			Shapiro Wilk GOF Test	
364			5%	6 Shap	oiro Wilk	Critic	cal Value	0.859		Data No	ot Normal at 5% Significance Level	
365					Lilliefors	s Test	Statistic	0.43			Lilliefors GOF Test	
366				5%	Lilliefors	Critic	al Value	0.243		Data No	ot Normal at 5% Significance Level	
367							Data Not	Normal at 5	% Significa	nce Level		
368												
369						Back	ground S	tatistics Ass	uming Norm	nal Distribution	n	
370			95	% UT	L with	95% C	Coverage	72.84			90% Percentile (z)	48.56
371						95%	6 UPL (t)	58.37			95% Percentile (z)	54.63
372						9!	5% USL	65.31			99% Percentile (z)	66
373								l .			,	
374								Gamma	GOF Test			
375					A-D) Test	Statistic	1.988		Ander	rson-Darling Gamma GOF Test	
376					5% A-D) Critic	al Value	0.732		Data Not Gam	nma Distributed at 5% Significance Lev	el
377					K-S	S Test	Statistic	0.379		Kolmog	orov-Smirnov Gamma GOF Test	
378					5% K-S	Critic	al Value	0.246	Γ	Data Not Gam	nma Distributed at 5% Significance Lev	el
379					[Data N	Not Gamr	na Distribute	ed at 5% Sig	nificance Lev	/el	
380												
381									Statistics			
382							at (MLE)				k star (bias corrected MLE)	4.157
383					Tł		at (MLE)				Theta star (bias corrected MLE)	6.537
384							at (MLE)				nu star (bias corrected)	99.78
385				MLE	Mean (b	oias co	orrected)	27.18			MLE Sd (bias corrected)	13.33
386												
387									uming Gamı	ma Distributio		
388			on Hilferty	` '							90% Percentile	45.04
389		95% Hawk		` '							95% Percentile	52.14
390		5% WH App									99% Percentile	67.29
391	95	5% HW App	rox. Gamm	na UT								
392						95%	WH USL	61.85			95% HW USL	61.42
393												
394							<u> </u>		I GOF Test			
395							Statistic			-	piro Wilk Lognormal GOF Test	
396			5%				cal Value				Lognormal at 5% Significance Level	
397							Statistic				liefors Lognormal GOF Test	
398				5%	Lilliefors		cal Value				Lognormal at 5% Significance Level	
399						D	ata Not L	ognormal at	5% Signific	ance Level		
400												

	Α	В	С	D	Е	F	G	Н		ı	J	K	L
401		•	•	·	Background Sta	tistics assur	ning Lognori	mal Distribu	ıtion			•	
402			95%	UTL with	95% Coverage	71.76					90%	Percentile (z)	40.73
403					95% UPL (t)	51.21					95%	Percentile (z)	46.92
404					95% USL	60.2					99%	Percentile (z)	61.18
405							+						
406					Nonparametric	Distribution	Free Backgr	ound Statis	stics				
407					Data do not fo	ollow a Disc	ernible Distri	bution (0.0	5)				
408													
409				Non	parametric Upp	er Limits for	Background	Threshold	Value	es			-
410				Ord	er of Statistic, r	12				95%	UTL with	95% Coverage	79.4
411		Ap	prox, f used	to comput	e achieved CC	0.632	Approxima	te Actual C	Confide	ence Co	pefficient acl	hieved by UTL	0.46
412							Approxir	nate Samp	le Siz	e neede	ed to achieve	e specified CC	59
413	9:	5% Percentil	e Bootstrap	UTL with	95% Coverage	79.4		95% B	CA Bo	otstrap	UTL with	95% Coverage	79.4
414					95% UPL	79.4					9	0% Percentile	26.55
415				90% C	hebyshev UPL	79.29					9	5% Percentile	50.36
416				95% C	hebyshev UPL	102.9					9	9% Percentile	73.59
417					95% USL	79.4							
418													
419					eld a conservati							_	
420		Therefore	, one may us		estimate a BTV							ee of outliers	
421					sists of observa			•					
422		TI	he use of US	SL tends to	provide a balar	nce between	false positiv	es and fals	se neg	atives p	provided the	data	
423		re	presents a b	ackground	data set and w	hen many o	nsite observa	ations need	to be	compa	red with the	BTV.	
424													
425	COD (CHE	MICAL OXY	GEN DEMAN	ND)									
426													
427						General	Statistics						
428			Total	l Number c	of Observations	47				Numbe	er of Missing	Observations	0
429			Numbe	r of Distino	t Observations	4							
430				Nun	nber of Detects	0					Number o	f Non-Detects	47
431			N	umber of D	Distinct Detects	0				Numb	er of Distino	t Non-Detects	4
432				N	linimum Detect	N/A					Minimu	m Non-Detect	5
433				M	aximum Detect	N/A						m Non-Detect	75
434					iance Detected	N/A					Percen	t Non-Detects	100%
435				•	Mean Detected	N/A						SD Detected	N/A
436			Mean	of Detecte	d Logged Data	N/A				SD	of Detected	d Logged Data	N/A
437													
438	<u> </u>	Warr	ning: All obse	ervations a	re Non-Detects			istics and e	stimat			NDs!	
439													
1 7		<u> </u>			CLs, UPLs, and								
440	1	<u> </u>			CLs, UPLs, and e alternative site								
440	1	<u> </u>	eam may de	ecide to use	e alternative site	e specific va	lues to estim	nate enviro	nment	al parai	meters (e.g.,		
	1	<u> </u>	eam may de	ecide to use		e specific va	lues to estim	nate enviro	nment	al parai	meters (e.g.,		
441	1	<u> </u>	eam may de	ecide to use	e alternative site	e specific va	lues to estim	nate enviro	nment	al parai	meters (e.g.,		
441 442 443 444		The Project T	eam may de	ecide to us	e alternative site	e specific va	lues to estim	nate enviro	nment	al parai	meters (e.g.,		
441 442 443 444	CHLORIDE	The Project T	eam may de	ecide to us	e alternative site	e specific va	lues to estim	nate enviro	nment	al parai	meters (e.g.,		
441 442 443 444	CHLORIDE	The Project T	eam may de	ecide to us	e alternative site	e specific va	lues to estim	nate enviro	nment	al parai	meters (e.g.,		
441 442 443 444 445		The Project T	The o	ecide to use	e alternative site	e specific va	lues to estim	nate enviro	nment	al parar	neters (e.g.,	EPC, BTV).	
441 442 443 444 445 446	CHLORIDE	The Project T	The o	ecide to use	e alternative site variable COD	e specific va	lues to estim	nate enviro	nment	al parar	neters (e.g.,		41
441 442 443 444 445 446 447	CHLORIDE	The Project T	The o	data set for	e alternative site	e specific va	lues to estim	nate enviro	nment	al parar	neters (e.g.,	EPC, BTV).	41 22.2 24.8

4 E4	Α	В	С	D	E Maximum	F 34.5	G	Н		J Third C	K Quartile	L 26.45
451					Mean	24.73					SD	3.635
452				Coeffici	ent of Variation	0.147				Ske	ewness	0.643
453				Mean	of logged Data					SD of logge		0.145
454												
455 456				-	Critical Values f	or Backgroui	nd Threshold	d Values (BT	Vs)			
457			Tole		tor K (For UTL)	-		•		d2max (fc	or USL)	2.933
458												
459						Normal (GOF Test					
460			(Shapiro Wi	lk Test Statistic	0.954			Shapiro Wi	lk GOF Test		
461			5% 5	Shapiro Wil	k Critical Value	0.946		Data app	ear Normal a	at 5% Significance	Level	
462				Lilliefor	s Test Statistic	0.105			Lilliefors	GOF Test		-
463			ļ	5% Lilliefor	s Critical Value	0.128		Data app	ear Normal a	at 5% Significance	Level	-
464					Data appe	ar Normal at	5% Signific	ance Level				
465												
466					Background S	Statistics Ass	uming Norm	al Distributio	n			
467			95%	UTL with	95% Coverage	32.26				90% Percer	ntile (z)	29.38
468					95% UPL (t)	30.89				95% Percer	ntile (z)	30.7
469					95% USL	35.38				99% Percer	ntile (z)	33.18
470											I	
471						Gamma	GOF Test					
472				A-	D Test Statistic	0.465		Ande	rson-Darling	Gamma GOF Test	t	
473				5% A-I	O Critical Value	0.747	Detecte	ed data appe	ar Gamma D	istributed at 5% Si	gnifican	ce Level
474				K-	S Test Statistic	0.0899		Kolmog	orov-Smirno	v Gamma GOF Te	est	
475				5% K-9	S Critical Value	0.129	Detecte	ed data appe	ar Gamma D	istributed at 5% Si	gnifican	ce Level
476				Detect	ed data appea	r Gamma Dis	stributed at 5	5% Significan	ce Level			
477												
478						Gamma	Statistics					
479					k hat (MLE)	48.52			k	star (bias corrected	d MLE)	45.44
480				Т	heta hat (MLE)	0.51			Theta	star (bias corrected	d MLE)	0.544
481					nu hat (MLE)					nu star (bias cor	'	4271
482			N	1LE Mean (bias corrected)	24.73				MLE Sd (bias cor	rected)	3.668
483												
484					Background S		uming Gamr	na Distributio	n			
485			• ,	,	x. Gamma UPL					90% Per		29.53
486			• •	,	x. Gamma UPL					95% Per		31.05
487					95% Coverage					99% Per	rcentile	34.05
488	95	5% HW Appr	ox. Gamma	UTL with	95% Coverage							_
489					95% WH USL	36.59				95% H	W USL	36.78
490												
491						-	I GOF Test					
492					lk Test Statistic				_	normal GOF Test		
493			5% S		k Critical Value					l at 5% Significance	e Level	
494					rs Test Statistic					ormal GOF Test		
495			!	5% Lilliefor	s Critical Value		<u> </u>			l at 5% Significance	e Level	
496					Data appea	r Lognormal	at 5% Signif	icance Level				
497												
498					Background Sta		ning Lognor	mal Distribut	ion			
499			95%	UTL with	95% Coverage					90% Percer	` ,	29.47
500					95% UPL (t)	31.3				95% Percer	ntile (z)	31.07

	Λ	В									1 0	1 11					- 1		1/	
E01	A	В	J	С		D		95% U	SL	F 37.45	G	Н		<u> </u>			9% P		K itile (z)	34.3
501																			()	
502							Nonp	parame	tric [Distribution	Free Backg	round Stati	istics							
503											t 5% Signific									
504								•	•											
505						Non	paraı	metric l	Jppe	er Limits fo	r Backgroun	d Threshol	ld Valu	ies						
506							-	Statisti		46					% UT	ΓL witl	n 95%	% Co	verage	34.3
507			Appr	ox, f use	ed to					1.211	Approxim	ate Actual	Confid						J	0.688
508												mate Sam							,	93
509	9!	5% Perce	ntile l	Bootstra	p UTI	_ with	95%	Covera	age	34.44	1-1-		•						verage	34.44
510								95% U		33.62									centile	28.42
511						90% C				35.74									centile	31.85
512						95% C				40.74									centile	34.41
513								95% U		34.5								0 1 01	00111110	
514								3370 0	OL	J4.5										
515		Note: T	he us	e of US	Lten	de to vie	eld a	conser	vativ	ve estimate	of BTV, esp	necially wh	en the	samn	رزی مار	re stal	ts avo	-pedir	ng 20	
516											the data set									
517		THEIEI	ore, c	nie iliay							ted from cle			_		ila Se	ı nee	OI OU	uicis	
518			Tho	use of I							n false positi	•				vidad	the de	nto.		
519											nsite observ			•	•					
520			Tepre	2561115 a	Dack	ground	uala	i Set all	u wi	len many c	msite observ	alions nee	u io b	e com	parec	ı willi	шев	I V.		
521	FLUORIDE																			
522	FLOORIDE																			
523										Conorol	Statistics									
524				To	tal Ni	ımber o	of Ob/	convotic	\nc	46	Statistics			Num	hor o	f Mice	ina O	bcon	ations	1
525						Disting				7				Num	ibei o	or iviiss	sing O	bserv	alions	· · · · · · · · · · · · · · · · · · ·
526				Numi	ber or			of Dete		15						\ a.la	£ N	lan D	etects	31
527					Nium	ber of E				6				Nium					Detects	2
528					Nulli			um Det		0.12				inui	nbei				Detect	0.2
529								um Det		0.12									Detect	0.2
530								e Detec		0.00157									etects	67.39%
531								Detec		0.00137						rei			tected	0.0396
532															2D - 6	· D - 1 -				
533				iviea	an or i	Detecte	ea Lo	ggea D	ata	-1.881					סט טו	Dete	cied L	ogge	d Data	0.237
534							\	al Malica	- 6-	n Da alsana.	nd Thunchal	d \ /alaa /[DT\ (=\							
535				т.		ce Fact				2.079	nd Threshol	u values (i	DIVS)				40	/f-	- LICL \	2.024
536				10	neran	се гас	IOI N	(F01 U	I L)	2.079							uzilia	oi) xe	r USL)	2.924
537								k i	Or	al COE To	st on Detects	Only								
538					Cha	oiro \^/:	ll Tar			0.807	or Defects	o Only	01	hapiro	/V/:II-	COF	Test			
539				E0/		oiro Wil oiro Will				0.807		Doto		n apiro Iormal				00 0	wol	
540				3%								Data		Lilliefo		•		ce Le	vei	
541						Lilliefor				0.263		Date						oc I -	wo!	
542					ე% I	Lilliefors	s Crit				10/ Olamis		INOU IN	lormal	at 5%	o Sigr	ıııcanı	ce Le	vel	
543								Data	JON	ivormal at t	5% Significa	nce Level								
	1							/// 4 5			ulada - A	-1 A1	-1.5'	alla de						
544					.,			(KM)R	ack	ground Sta	tistics Assun	ning Norma	aı Dist	ributio	n					
544 545					Ka	aplan M				0 4 10									(M 00	0 0000
						·		KM Me		0.142							0==:		KM SD	0.0293
545					95	% UTL	95%	KM Me	ige	0.203								KM l	JPL (t)	0.192
545 546					95	% UTL	95% /I Per	KM Me	ige (z)	0.203 0.18						95%	KM Pe	KM l ercen	JPL (t)	0.192 0.19
545 546 547					95	% UTL	95% /I Per	KM Me	ige (z)	0.203						95%	KM Pe	KM l ercen	JPL (t)	0.192

	Α	В	3	С		D	Е	F	G	Н	Į	J	K	L	
551					D	L/2 Subs	titution Back	ground Statis	stics Assumir	ng Normal Di	stribution				
552							Mean	0.158					SD	0.0645	
553					959	% UTL95	% Coverage	0.292				Ś	95% UPL (t)	0.267	
554						90% F	Percentile (z)	0.24				95% P	ercentile (z)	0.264	
555						99% F	Percentile (z)	0.308					95% USL	0.346	
556				DL/2 is	not a	recomn	nended meth	od. DL/2 pro	vided for com	nparisons an	d historical ı	reasons			
557															
558						(Gamma GOF	Tests on De	tected Obser	rvations Only	1				
559						A-D	Test Statistic	1.282		Α	nderson-Da	rling GOF Tes	it		
560					Ę	5% A-D (Critical Value	0.735	Da	ata Not Gam	ma Distribu	ted at 5% Sigr	nificance Lev	el	
561						K-S	Test Statistic	0.254		k	Colmogorov-	Smirnov GOF			
562					į	5% K-S (Critical Value	0.221	Da	ata Not Gam	ma Distribu	ted at 5% Sigr	nificance Lev	el	
563						Da	ata Not Gam	na Distribute	d at 5% Sign	nificance Lev	el				
564															
565							Gamma	Statistics on	Detected Da	ata Only					
							k hat (MLE)	18.4			k	star (bias corr	ected MLE)	14.76	
566						The	eta hat (MLE)				Theta	star (bias corr	ected MLE)	0.0106	
567							nu hat (MLE)					nu star (bia:	,	442.9	
568				M	/LE N		as corrected)					(/		
569						-	as corrected)				95% Percer	ntile of Chisqu	are (2kstar)	43.19	
570						((=::::,		
571							Gamma ROS	Statistics us	ing Imputed	Non-Detects	<u> </u>				
572				GROS may	v not							t multiple DLs			
573		GROS	S may									ize is small (e	n <15-20)		
574			Jillay						yield incorre	-		· · · · · · · · · · · · · · · · · · ·	.g., 110 20)		
575									en the sample						
576		Fo	or dan	nma distribu	uted		<u> </u>		<u> </u>			ution on KM e	stimates		
577			Ji guii				Minimum			- Cu doing gai			Mean	0.144	
578							Maximum						Median	0.139	
579							SD						CV	0.22	
580							k hat (MLE)				k	star (bias corr		21.09	
581						The	eta hat (MLE)					star (bias corr	,	0.00684	
582							nu hat (MLE)					nu star (bias	ŕ	1941	
583				M	ΛΙΕΝ		as corrected)					MLE Sd (bias	,	0.0314	
584						`	uare (2kstar)					· · · · · · · · · · · · · · · · · · ·	6 Percentile	0.186	
585							% Percentile						Percentile	0.227	
586				The	follo				Gamma RO	S Statistics	on Imputed			J.LL/	
587									l) and Hawkii						
588				<u> </u>	- ۲۲		WH	HW	.,		,	-	WH	HW	
589	95% A	pprox. Ga	ımma	UTL with 9	5% (Coverage		0.216		Q!	5% Approx	Gamma UPL	0.2	0.201	
590	227071	au				ıma USL		0.253					V. -		
591				3370	Juil	501	0.201	3.200							
592						F	stimates of G	amma Parar	neters using	KM Estimate	25				
593							Mean (KM)		doing				SD (KM)	0.0293	
594						\/	ariance (KM)					SF of	Mean (KM)	0.00562	
595						V	k hat (KM)					3L 0I	k star (KM)	22.1	
596							nu hat (KM)					٧	nu star (KM)	2033	
597						+1-	nu nat (KM) neta hat (KM)						ta star (KM)	0.00644	
598		80% gamma percentile									000		` '	0.00644	
599							. ,			90% gamma percentile (KM) 0.182 99% gamma percentile (KM) 0.222					
600				959	% ga	ırnma pe	rcentile (KM)	0.196			999	∞ gamma per	centile (KM)	0.222	

	Α	В		С		D		Е		F		G		Н					J		K		L
601																							
602				Т		llowing st			-									es					
603					Upp	er Limits					H) an	d Hawl	kins V	Vixley	(HW) Meth	ods						
604	050/ 4			- ···	050/			WH		W					050	, .					NH		lW
605	95% Ap	prox. Gam						0.203		0.203					95%	6 Appro					0.19		0.19
606			95%	KM Gar	nma I	Percentil	е	0.189	(0.188						95	5% C	iamn	na USI	'	0.232		0.233
607								ormal G0	>⊏ T -	at an D	\	had Ob		4 1	Only								
608					Cho	piro Wilk				0.828	etec	lea Obs	serva	uons		Shapiro	. \A/: II	r CO	E Toot				
609				5%		oiro Wilk).881			Г)ata N		gnorm					Lovol		
610				3 /0		Lilliefors				0.24				Jala IV	NOI LC	Lillief				Jance	Level		
611						Lilliefors				0.24			Г)ata N	lot I c	gnorm				cance	ו בעבו		
612					J /0	Lillieloi3		ata Not			15%	Signific				gnom	iai at	. 5 /0 .	Sigriffic	Jance	Levei		
613								ata Not	Logiic	Jilliai at	1070	Olgrillic	Janice	Leve	71								
614			Bac	karoun	d L oa	normal R	os:	Statistics	: Assı	ımina l	oanc	rmal D	istrih	ution	Usino	ı İmput	ted N	Von-F)etects				
615			Duc	ongi odi n		Mean in (0.145	J	,,,,,,	10010	u	031116	, iiipu	tou i	1011 L			og Scal	ـ د	1.953
616								nal Scale		0.0302											og Scale		0.197
617					95	5% UTL9	-			0.214						ç	95%	BCA			overage		0.2
618			95%	% Boots		%) UTL9		•		0.23											UPL (t		0.198
619				0 200.0				entile (z		0.183									95%		entile (z	<i>'</i>	0.196
620								entile (z	,	0.224											5% USI	<i>'</i>	0.252
621									<u> </u>														
622				Sta	atistic	s using K	(M e	stimates	on Lo	ogged D	Data a	and Ass	sumir	ng Log	gnorn	nal Dis	tribu	tion					
623 624						Mean of				.967									mal)9	5% C	overag	е	0.203
625						(M SD of				0.179				95% KM UPL (Lognormal)								0.189	
626				95% k	(M Pe	ercentile l	Logn	ormal (z) (0.188							95	5% K	M USL	_ (Log	normal)	0.236
627									-														
628						Back	grou	ind DL/2	Statis	stics As	sumi	ng Log	norm	al Dis	tribut	ion							
629					ľ	Mean in (Origi	nal Scale	e (0.158									Mean	in Lc	og Scal	e -	1.926
630						SD in (Origii	nal Scale	e 0	.0645									SD	in Lo	g Scale	Э	0.395
631					95	% UTL9	5% (Coverage	е (0.331										95%	UPL (t)	0.285
632						90%	Perc	entile (z) (0.242									95%	Perce	entile (z)	0.279
633						99%	Perc	entile (z) (0.365										95	5% USI	-	0.462
634				DL/2 is	not a	Recom	men	ded Meth	nod. D	L/2 pro	vide	d for co	ompai	risons	and	historic	cal re	easor	ns.				
635																							
636						N	onpa	arametrio	Distr	ibution	Free	Backg	roun	d Stat	istics								
637							Data	a do not	follow	a Disc	ernib	ole Disti	ributio	on (0.	05)								
638																							
639				Nonpa	rame	tric Uppe			•		nctio	n made	betw	een d	detect				•				
640								Statistic,		.5											overag		0.5
641						compute				1.184	Ap	proxim	nate A	ctual	Conf	idence	Coe	etticie	nt ach		by UT		0.677
642	Approxi	imate Sam	ple S	ize need	ded to	achieve				3								NEO/ :	() (C ·		5% UPI		0.5
643								95% USL	_ (0.5							9	15% k	KM Che	ebysh	nev UPI	-	0.271
644			1.		\ .	<u> </u>			41.	_41 .		T) (U		
645						ds to yiel											•						
646		I heref	ore, c	one may		USL to e										_		ata s	set fre	e of o	outliers		
647			T .	*		and cons													4.0	4			
648						ends to p																	
649			repre	esents a	Dack	ground o	iata :	set and v	wnen	rnany o	nsite	opser	vatior	is nee	ea to	be com	npare	ed Wi	ın the l	۵۱V.			
650																							

_										_	_			_						
651	IRON, TO	DTAL	В		С		D		E	F	G	Н	<u> </u>	J	K	L				
652																				
653										General	Statistics									
654					Т	otal N	lumber o	f Ob	servations	47			Numbe	er of Missing (Observations	0				
655					Nur	nber o	of Distinc	t Ob	servations	14										
656							Nun	ber	of Detects	16				Number of	Non-Detects	31				
657						Nur	nber of D	Distir	nct Detects	12			Numb	er of Distinct	Non-Detects	2				
658							M	inim	num Detec	t 0.07				Minimum	Non-Detect	0.05				
659							Ma	axim	num Detec	t 1.8				Maximum	Non-Detect	0.06				
660							Vari	anc	e Detected	0.201				Percent	Non-Detects	65.96%				
661									n Detected						SD Detected	0.448				
662					М	ean of	Detecte	d Lo	ogged Data	a -1.672			SD	of Detected	Logged Data	0.883				
663																				
664							C	ritic	al Values f	for Backgrou	nd Threshold	Values (BT	√s)							
665					•	Tolera	nce Fact	or K	(For UTL)	2.074				d2m	ax (for USL)	2.933				
666										•										
667										mal GOF Tes	t on Detects	Only								
668							•		est Statistic				•	ilk GOF Test						
669					5	% Sha			itical Value			Data No		5% Significa	nce Level					
670							Lilliefor	s Te	est Statistic	1			Lilliefors	GOF Test						
671						5%	Lilliefors	s Cri	itical Value				t Normal at	5% Signification	nce Level					
672									Data No	t Normal at 5	% Significan	ce Level								
673																				
674							Kaplan M	leier	·(KM) Bac	kground Stat	istics Assumi	ing Normal D	Distribution			0.282				
675									KM Mear											
676						9			Coverage				95% KM UPL (t)							
677									ercentile (z						Percentile (z)	0.602				
678							99% KN	1 Pe	ercentile (z	0.794				9	5% KM USL	0.965				
679																				
680							DL/2 Sul	bstit		ground Stati	stics Assumir	ng Normal D	istribution							
681									Mear						SD	0.289				
682						9			Coverage						95% UPL (t)	0.616				
683									ercentile (z					95% F	Percentile (z)	0.601				
684									rcentile (z	'	<u> </u>				95% USL	0.973				
685					DL/2	! is no	t a recon	nme	nded metr	od. DL/2 pro	vided for con	nparisons an	d historical	reasons						
686																				
687										Tests on De	etected Obse									
688									est Statistic					arling GOF Te						
689									itical Value		D			ited at 5% Sig		/el				
690									est Statistic					-Smirnov GO						
691	1	5% K-S Critical Valu											ıted at 5% Siç	Initicance Lev	/el					
692						Data Not Gamma Distributed at 5% Significance Level														
693										0										
694											s on Detected Data Only k star (bias corrected MLE									
695									hat (MLE)					•	•	0.961				
696							T		hat (MLE				I heta	star (bias co		0.323				
697							- 14		hat (MLE	'				nu star (bia	as corrected)	30.74				
698							•		corrected	^		/01	F 000							
699						N	/ILE Sd (I	bias	corrected	0.317			95% Perce	entile of Chisq	uare (2kstar)	5.838				
700																				

	Α	В	С	D	Е	F	G	Н	I	J	K	L
701							ing Imputed I					
702				y not be used v						•		
703		GROS may		d when kstar o				•	•	•	.g., <15-20)	
704			Fo	or such situatio	•	•	•			TVs		
705					•	-	en the sample					
706		For gar	nma distribu	ited detected d			ay be compute	ed using gan	nma distribu	ition on KM es		
707					Minimum	0.01					Mean	0.112
708					Maximum	1.8					Median	0.01
709					SD	0.294					CV	2.614
710					k hat (MLE)	0.454				star (bias corr	1	0.439
711					a hat (MLE)	0.247			I heta s	star (bias corr	1	0.256
712					ı hat (MLE)	42.67				nu star (bias	1	41.28
713				LE Mean (bias	,	0.112				MLE Sd (bias	,	0.17
714			95% Percei	ntile of Chisqua	, ,	3.533					6 Percentile	0.312
715			The section		Percentile	0.452	0	0.04-41-41			Percentile	0.8
716				following statis Upper Limits u		-			-			
717			'	opper Limits u	WH	HW	i) and Hawkin	is wixiey (m	/v) ivietnous		WH	HW
718	OE9/ App	rov Commo	LITI with Of	5% Coverage	0.522	0.521		05	0/ Approx (Gamma UPL	0.376	0.36
719	93 % App	iox. Gaiiiiia		Gamma USL	0.986	1.082		93	7/6 Арргох. (Janina OF L	0.370	0.30
720			93 /6	Gaillilla USL	0.900	1.002						
721				Fet	imates of G	amma Parar	neters using h	KM Fetimate	e			
722					Mean (KM)	0.139		NW LSumate			SD (KM)	0.282
723					riance (KM)	0.0794				SE of	Mean (KM)	0.0424
724				v ui	k hat (KM)	0.242					k star (KM)	0.241
725				r	nu hat (KM)	22.79					nu star (KM)	22.67
726					ta hat (KM)	0.572					ta star (KM)	0.575
727			809	% gamma perd	` '	0.199			90%	6 gamma per	` '	0.417
728 729				% gamma perd		0.679			99%	1.378		
730					<u> </u>							
731			The	following stat	istics are co	mputed usin	g gamma dis	tribution and	KM estima	tes		
732			ı	Jpper Limits u	sing Wilson	Hilferty (WH	l) and Hawkin	s Wixley (H\	W) Methods			
733					WH	HW					WH	HW
734	95% App	rox. Gamma	UTL with 95	5% Coverage	0.487	0.465		95	% Approx. (Gamma UPL	0.381	0.359
735		95	% KM Gamr	na Percentile	0.368	0.346			95% (Gamma USL	0.797	0.791
736				,							<u>"</u>	
737				-			etected Obse					
738				Shapiro Wilk Te		0.834			•	k GOF Test		
739			5% S	Shapiro Wilk Cr		0.887		Data Not L		t 5% Significa	nce Level	
740					est Statistic	0.255				GOF Test		
741			5	5% Lilliefors Cr		0.213			ognormal a	t 5% Significa	ince Level	
742					Data Not L	ognormal at	5% Significar	nce Level				
743												
744		В	ackground l	ognormal RO			ognormal Dist	tribution Usir	ng Imputed I			_
745				Mean in Ori		0.117					n Log Scale	-3.592
746					ginal Scale	0.292					n Log Scale	1.747
747				95% UTL95%	•	1.031			95%	BCA UTL959	-	1.32
748		9	5% Bootstra	ap (%) UTL95%		1.536					95% UPL (t)	0.533
749					ercentile (z)	0.258				95% P	ercentile (z)	0.487
750				99% Pe	ercentile (z)	1.602					95% USL	4.62

				-		_		-		1					17	
751	Α	В	С		D	<u> </u>	E	F	G	Н		ļ		J	K	L
752			Sta	tistic	s using K	M es	stimates	on Logged D	Data and Ass	suming Log	gno	rmal Dist	tribut	ion		
753					Mean of					-	-				5% Coverage	0.413
					(M SD of								95	% KM UPL	(Lognormal)	0.306
754			95% K		ercentile L										(Lognormal)	0.823
755							. ,								,	
756					Back	aroui	nd DL/2	Statistics As	sumina Loa	normal Dis	strib	ution				
757				1	Mean in C									Mean	in Log Scale	-2.886
758						_	nal Scale								in Log Scale	1.016
759				95	5% UTL95										95% UPL (t)	0.313
760							entile (z)								Percentile (z)	0.297
761							entile (z)								95% USL	1.098
762			DL/2 is	not a				od. DL/2 pro	vided for co	mparisons	s an	d historic	al re	asons.		
763											-					
764					No	onna	rametric	Distribution	Free Backa	round Stat	tistic	`S				
765						•		ollow a Disc	•							
766							- 40 11011			ibadoii (o.						
767			Nonnar	rame	tric Unne	r I im	nits for B	TVs(no distir	nction made	hetween o	dete	cts and r	nond	etects)		
768			Horipai				tatistic, r	· ·	louon mado	DOLIVOON					5% Coverage	0.92
769		Δr	prox, f use	od to			•		Annroxim	ate Actual	Col				eved by UTL	0.688
770	Annroxir	nate Sample							, tpproxim	ato / totaai					95% UPL	0.7
771	7 (5)					•	5% USL						QI	5% KM Che	ebyshev UPL	1.38
772							70 70 000	1.0						570 TAW ONC	by sheve of E	
773		Note: The	use of USI	l ton	de to viel	d a c	onconvat	tive estimate	of RTV est	necially wh	non i	the camp	olo ci	zo starte ov	reading 20	
774								only when								
775		THEICIOIC	, one may					ations collec						ata set iret	or outliers	
776		TI	he use of l					nce between						wided the c	lata	
777								when many o				_				
778					.ground d								Paro	- William Cho		
779	IRON, DISS	SOLVED														
780																
781								General	Statistics							
782			Tot	al Nu	umber of	Obse	ervations					Num	nber (of Missina (Observations	34
783					Distinct (3		
784					Numb	er of	f Detects	0						Number of	Non-Detects	12
785				Num	ber of Dis	stinct	t Detects					Nur			Non-Detects	2
786							m Detect								Non-Detect	0.05
787							m Detect							Maximum	Non-Detect	0.06
788					Varia	nce [Detected							Percent	Non-Detects	100%
789							Detected								SD Detected	N/A
790			Mea	n of	Detected							(SD o		Logged Data	N/A
791														·		
792		Warr	ning: All ob	serva	ations are	Nor	n-Detects	s (NDs), ther	efore all sta	tistics and	esti	imates sh	hould	d also be Ni	Os!	
793			_					other statis								
794	7	The Project T	•										_			
795								,						(9-1	, · <i>r</i>	
796					The dat	ta se	t for vari	able IRON, I	DISSOLVED) was not r	oroc	essed!				
797																
798																
799	MAGNESIL	JM. TOTAI														
800	.,, (GIALOIC	,,, , O I AL														

	Α	В	С	\top	D	T	E	F	G	Тн		1		J		K	L	
801					_									-				
802	General Sta	tistics																
803			Tota	al Nur	mber of	Obser	vations	46				Nun	nber o	f Distinct	Obs	ervations	25	
804												Nun	nber of	Missing	Obs	ervations	1	
805						М	inimum	4.6							Firs	t Quartile	8.425	
806					Se	cond	Largest	10.4								Median	8.9	
807						Ma	aximum	10.6							Third	d Quartile	9.45	
808							Mean	8.75		SD								
				C	oefficier	nt of V	ariation	0.126							S	kewness	-1.966	
809					Mean o	f logae	ed Data	2.159	SD of logged Data									
810									OD OI logged Data									
811					Cri	itical V	/alues fo	r Backgrour	nd Threshold Values (BTVs)									
812			Tole	eranc	e Facto			2.079		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				d2	max	(for USL)	2.924	
813																(
814								Normal C	OF Test									
815				Shan	iro Wilk	Test 9	Statistic	0.833	1001			Shaniro	Wilk	GOF Tes	t .			
816					iro Wilk			0.945		Data	No.	•		Significa		Level		
817			370 (illiefors			0.943		Date	1110			OF Test	ance	Levei		
818					illiefors			0.13		Data	. No			Significa	anaa	Lovel		
819				3 % LI	IIIIEIOIS			Normal at 5	0/ Cianific		INO	i Noma	al 3 /c	Significa	ance	Levei		
820							ata Not	Normal at 5	% Significa	ance Level								
821						D I			! NI	Distable								
822			050/					tatistics Ass	uming Nori	mai Distribi	utior	1		000/	_		40.47	
823			95%	UIL	with 9		overage	11.05								centile (z)	10.17 10.57	
824							UPL (t)	10.63			95% Percentile (z) 99% Percentile (z)							
825						959	% USL	11.98				11.32						
826										Test								
827									GOF Test	Anderson-Darling Gamma GOF Test								
828							Statistic	2.714										
829				5	5% A-D			0.747		Data Not (vel	
830							Statistic	0.179						Gamma (
831				5	5% K-S			0.13		Data Not (ibuted	at 5% S	ignifi	cance Le	vel	
832					D	ata No	ot Gamn	na Distribute	ed at 5% Significance Level									
833																		
834								Gamma	Statistics									
835						k ha	t (MLE)	50.94					k sta	r (bias co	orrec	ted MLE)	47.63	
836					The	eta ha	t (MLE)	0.172				Th	eta sta	r (bias co	orrec	ted MLE)	0.184	
837						nu ha	t (MLE)	4687					r	nu star (b	ias c	orrected)	4382	
838			N	VLE V	∕lean (bi	ias cor	rected)	8.75	MLE Sd (bias corrected)								1.268	
839																		
840					Е	3ackgr	ound St	atistics Assu	tics Assuming Gamma Distribution									
841		95% Wilso	on Hilferty (WH)	Approx.	Gamr	na UPL	10.96		90% Percentile						10.41		
842		95% Hawkins Wixley (HW) Approx. Gamma							95% Percentile							10.93		
843	95% WH Approx. Gamma UTL with 95% Cov							11.52	2 99% Percentile							11.97		
844	95% HW Approx. Gamma UTL with 95% Cov						overage	11.6									l	
845	*				9	95% V	VH USL	12.82							95%	HW USL	12.96	
846									<u> </u>								<u>l</u>	
847						-		Lognormal	GOF Test	<u> </u>								
				Shap	iro Wilk	Test S	Statistic	0.723			Shap	iro Wilk	Logno	rmal GO	F Te	st		
848	5% Shapiro Wilk Critical V							0.945						% Signifi				
849					illiefors			0.198	Lilliefors Lognormal GOF Test									
850						. 551 (3.100			-111	.5.5.5 LU	g. 10111		. 551			

A B C D E	F	G H I J K	ı
A B C D E 5% Lilliefors Critical Value	0.129	Data Not Lognormal at 5% Significance Level	L
Data Not L	ognormal at	5% Significance Level	
Background Sta	tistics assur	ning Lognormal Distribution	
95% UTL with 95% Coverage	11.87	90% Percentile (z)	10.52
95% UPL (t)	11.2	95% Percentile (z)	11.11
95% USL	13.48	99% Percentile (z)	12.32
Nonparametric	Distribution	Free Background Statistics	
Data do not fo	ollow a Disce	ernible Distribution (0.05)	
Nonparametric Upp	er Limits for	Background Threshold Values	
Order of Statistic, r	45	95% UTL with 95% Coverage	10.4
Approx, f used to compute achieved CC	1.184	Approximate Actual Confidence Coefficient achieved by UTL	0.677
		Approximate Sample Size needed to achieve specified CC	93
·		95% BCA Bootstrap UTL with 95% Coverage	10.45
		90% Percentile	9.7
-		95% Percentile	9.95
·	13.62	99% Percentile	10.51
95% USL	10.6		
•			
		*	
represents a background data set and w	hen many o	nsite observations need to be compared with the BTV.	
MACNESILIM DISSOLVED			
MAGNESIUM, DISSOLVED			
General Statistics			
	12	Number of Distinct Observations	
		Number of Missing Observations	10
Minimum	7.3	First Quartile	10 34
Second Largest			34
Second Largest	9.8	Median	34 8.525
Maximum	9.8		34
		Median	34 8.525 9.25
Maximum	10.7	Median Third Quartile	34 8.525 9.25 9.6
Maximum Mean	10.7 9.033	Median Third Quartile SD	34 8.525 9.25 9.6 0.992
Maximum Mean Coefficient of Variation	10.7 9.033 0.11	Median Third Quartile SD Skewness	34 8.525 9.25 9.6 0.992 -0.491
Maximum Mean Coefficient of Variation Mean of logged Data	10.7 9.033 0.11 2.195	Median Third Quartile SD Skewness	34 8.525 9.25 9.6 0.992 -0.491
Maximum Mean Coefficient of Variation Mean of logged Data	10.7 9.033 0.11 2.195	Median Third Quartile SD Skewness SD of logged Data	34 8.525 9.25 9.6 0.992 -0.491
Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for	10.7 9.033 0.11 2.195	Median Third Quartile SD Skewness SD of logged Data and Threshold Values (BTVs)	34 8.525 9.25 9.6 0.992 -0.491 0.114
Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for	10.7 9.033 0.11 2.195 or Backgrour 2.736	Median Third Quartile SD Skewness SD of logged Data and Threshold Values (BTVs)	34 8.525 9.25 9.6 0.992 -0.491 0.114
Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for	10.7 9.033 0.11 2.195 or Backgrour 2.736	Median Third Quartile SD Skewness SD of logged Data and Threshold Values (BTVs) d2max (for USL)	34 8.525 9.25 9.6 0.992 -0.491 0.114
Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for Tolerance Factor K (For UTL)	10.7 9.033 0.11 2.195 or Backgrour 2.736	Median Third Quartile SD Skewness SD of logged Data and Threshold Values (BTVs) d2max (for USL)	34 8.525 9.25 9.6 0.992 -0.491 0.114
Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for Tolerance Factor K (For UTL) Shapiro Wilk Test Statistic	10.7 9.033 0.11 2.195 or Backgrour 2.736 Normal C	Median Third Quartile SD Skewness Shewness SD of logged Data Median Third Quartile SD Skewness And Threshold Values (BTVs) d2max (for USL) GOF Test Shapiro Wilk GOF Test	34 8.525 9.25 9.6 0.992 -0.491 0.114
Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for Tolerance Factor K (For UTL) Shapiro Wilk Test Statistic 5% Shapiro Wilk Critical Value	10.7 9.033 0.11 2.195 or Backgrour 2.736 Normal C 0.935 0.859	Median Third Quartile SD Skewness SD of logged Data and Threshold Values (BTVs) d2max (for USL) GOF Test Shapiro Wilk GOF Test Data appear Normal at 5% Significance Level	34 8.525 9.25 9.6 0.992 -0.491 0.114
Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for Tolerance Factor K (For UTL) Shapiro Wilk Test Statistic 5% Shapiro Wilk Critical Value Lilliefors Test Statistic 5% Lilliefors Critical Value	10.7 9.033 0.11 2.195 or Backgrour 2.736 Normal C 0.935 0.859 0.153 0.243	Median Third Quartile SD Skewness SD of logged Data and Threshold Values (BTVs) d2max (for USL) GOF Test Shapiro Wilk GOF Test Data appear Normal at 5% Significance Level Lilliefors GOF Test	34 8.525 9.25 9.6 0.992 -0.491 0.114
Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for Tolerance Factor K (For UTL) Shapiro Wilk Test Statistic 5% Shapiro Wilk Critical Value Lilliefors Test Statistic 5% Lilliefors Critical Value	10.7 9.033 0.11 2.195 or Backgrour 2.736 Normal C 0.935 0.859 0.153 0.243	Median Third Quartile SD Skewness SD of logged Data and Threshold Values (BTVs) d2max (for USL) GOF Test Shapiro Wilk GOF Test Data appear Normal at 5% Significance Level Lilliefors GOF Test Data appear Normal at 5% Significance Level	34 8.525 9.25 9.6 0.992 -0.491 0.114
	Background States 95% UTL with 95% Coverage 95% UPL (t) 95% USL Nonparametric Data do not for Nonparametric Upp Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL 95% Chebyshev UPL 95% Chebyshev UPL 95% USL Note: The use of USL tends to yield a conservate Therefore, one may use USL to estimate a BTV and consists of observators are fully tends to provide a balance represents a background data set and we MAGNESIUM, DISSOLVED General Statistics Total Number of Observations Minimum	Background Statistics assur 95% UTL with 95% Coverage 11.87 95% UPL (t) 11.2 95% USL 13.48 Nonparametric Distribution Data do not follow a Disco Nonparametric Upper Limits for Order of Statistic, r 45 Approx, f used to compute achieved CC 1.184 95% Percentile Bootstrap UTL with 95% Coverage 10.55 95% UPL 10.26 90% Chebyshev UPL 12.1 95% Chebyshev UPL 13.62 95% USL 10.6 Note: The use of USL tends to yield a conservative estimate Therefore, one may use USL to estimate a BTV only when the and consists of observations collect The use of USL tends to provide a balance between represents a background data set and when many of MAGNESIUM, DISSOLVED General Statistics Total Number of Observations 12	Background Statistics assuming Lognormal Distribution 95% UTL with 95% Coverage 11.87 90% Percentile (z) 95% UPL (t) 11.2 95% Percentile (z) 95% UPL (t) 11.2 95% Percentile (z) 95% UPL (t) 11.2 95% Percentile (z) 95% UPL (t) 11.4 95% Coverage 15.87 95% UPL (t) 11.2 95% Percentile (z) 95% UPL (t) 11.2 95% Percentile (z) 95% UPL (t) 11.4 Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 10.26 95% BCA Bootstrap UTL with 95% Coverage 95% UPL 10.26 95% Percentile 95% Chebyshev UPL 12.1 95% Percentile 95% Chebyshev UPL 13.62 99% Percentile 95% USL 10.6 Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations. The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

									-		17	
001	A	В	C D D 95% UTL with	E 95% Coverage	F 11.75	G	Н	<u> </u>		J 90% Pe	K rcentile (z)	10.3
901				95% UPL (t)	10.89						rcentile (z)	10.67
902				95% USL	11.3						rcentile (z)	11.34
903				0070 002								
904					Gamma	GOF Test						
905			Δ_Γ	Test Statistic	0.486	1031	Ander	eon-Darlin	na Gan	nma GOF	Toet	
906				Critical Value	0.731	Dotocto	d data appea		-			neo Lovol
907				Test Statistic	0.751	Detected				amma GOI	•	Le Level
908				Critical Value	0.107	Dotocto	d data appea					neo Lovol
909				ed data appear					טואווו	Juleu at 57	o Significat	ice Level
910			Delecti	u uata appear	Gaillilla Dis	illibuted at 5	% Significant	Ce Level				
911					Gamma	Statistics						
912				k bot (MLF)	86.71	Sidusiics			l, otor	/higg garra	cted MLE)	65.09
913				k hat (MLE)						•		
914				neta hat (MLE)	0.104			I net		`	ected MLE)	0.139
915				nu hat (MLE)						`	corrected)	1562
916			MLE Mean (I	oias corrected)	9.033				ML	E Sd (bias	corrected)	1.12
917				<u> </u>			B1 - 2 - 2					
918				Background St		ıming Gamm	a Distributio	n				
919			son Hilferty (WH) Approx		11.02						Percentile	
920			kins Wixley (HW) Approx		11.04						Percentile	10.95
921			rox. Gamma UTL with	•	12.06					99%	Percentile	11.84
922	95	5% HW App	rox. Gamma UTL with	_								
923				95% WH USL	11.51					959	% HW USL	11.54
924												
925					Lognorma	GOF Test						
926			Shapiro Will	Test Statistic	0.916		Shap	iro Wilk Lo	ognorr	nal GOF T	est	
927			5% Shapiro Wilk	Critical Value	0.859		Data appea	r Lognorm	nal at 5	% Signific	ance Level	
928			Lilliefors	Test Statistic	0.174		Lill	iefors Log	norma	I GOF Tes	t	
929			5% Lilliefors	Critical Value	0.243		Data appea	r Lognorm	nal at 5	% Signific	ance Level	
930				Data appear	Lognormal	at 5% Signific	cance Level					
931												
932			E	ackground Sta	tistics assur	ning Lognorn	nal Distribution	on				
933			95% UTL with	95% Coverage	12.26					90% Pe	rcentile (z)	10.39
934				95% UPL (t)	11.11					95% Pe	rcentile (z)	10.83
935				95% USL	11.64					99% Pe	rcentile (z)	11.7
936												
937			1	lonparametric	Distribution	Free Backgro	ound Statistic	cs				
938				Data appea	ar Normal at	5% Significa	nce Level					
939												
940			Non	arametric Upp	er Limits for	Background	Threshold V	'alues				
941			Orde	r of Statistic, r	12			95%	% UTL	with 95%	Coverage	10.7
942		Α	approx, f used to compute	e achieved CC	0.632	Approxima	te Actual Co	nfidence C	Coeffic	ient achiev	ed by UTL	0.46
943						Approxin	nate Sample	Size need	ded to	achieve sp	ecified CC	59
944	95	5% Percent	ile Bootstrap UTL with	5% Coverage	10.7		95% BCA	A Bootstra	p UTL	with 95%	Coverage	10.7
945				95% UPL	10.7					90%	Percentile	9.78
946			90% C	nebyshev UPL	12.13					95%	Percentile	10.21
947			95% C	nebyshev UPL	13.53					99%	Percentile	10.6
				95% USL	10.7							
948						<u> </u>						
949		Note: The	e use of USL tends to yie	ld a conservati	ive estimate	of BTV. esne	ecially when	the sample	e size	starts exce	eedina 20	
950			- 155 5. SEE torido to yie	2 30,100, vati	Commute	, copt	23.0	oumpi	5 5.20	to oxot	30ig 20.	

	Α		В		С	I	D	E		F	G	Н	l		J		K	L
951			Inereto	ore, on	e may u						he data set r ted from clea	•			ata set tre	e of ou	utliers	
952				Thou	oo of LIG						false positiv	•			vidad tha	doto		
953											nsite observa		-					
954				repres	senis a L	ласку	Ji Ouriu ua	ala sel	and wi	nen many o	risite observa	alions need	to be com	pared	ı willi ille	DIV.		
955	MANGAN	IESI	= ΤΩΤΔΙ															
930	WANGAN	ILG	z, IOIAI	.L														
957										General	Statistics							
958					Tota	al Nur	mber of C	Ohserva	ations	47			Num	her c	of Missing	Ohser	vations	0
959							Distinct C			21								
960							Numbe	er of De	etects	45					Number o	f Non-Γ	Detects	2
961 962					N	Numb	er of Dis	tinct De	etects	19			Nur	nber	of Distinc	t Non-[Detects	2
963							Mini	imum D	Detect	0.04					Minimu	m Non-	-Detect	0.0056
964							Maxi	imum D	etect	0.58					Maximu	m Non-	-Detect	0.1
965							Varian	ice Det	ected	0.00759					Percen	t Non-Γ	Detects	4.255%
966							Me	an Det	ected	0.27						SD De	etected	0.0871
967					Mean	n of D	etected I	Logged	l Data	-1.37				SD of	Detected	l Logge	ed Data	0.4
968											1							
969							Crit	ical Va	lues fo	r Backgrou	nd Threshold	l Values (BT	Vs)					
970					Tole	eranc	e Factor	K (For	UTL)	2.074					d2	max (fo	or USL)	2.933
971																		
972									Norm	al GOF Tes	t on Detects	Only						
973					Ç	Shapi	iro Wilk 7	Test Sta	atistic	0.818			Shapiro	Wilk	GOF Tes	t		
974					5% 5	Shapi	ro Wilk C	Critical \	Value	0.945		Data N	ot Normal	at 5%	% Significa	ance Le	evel	
975						L	illiefors 7	Test Sta	atistic	0.188			Lilliefo	ors G	OF Test			
976					ļ	5% Li	illiefors C	Critical \	Value	0.131		Data N	ot Normal	at 5%	6 Significa	ance Le	evel	
977								Dat	ta Not	Normal at 5	% Significan	ce Level						
978																		
979						Ka	plan Mei			_	istics Assum	ing Normal	Distributio	n				
980									Mean	0.259							KM SD	0.0989
981							% UTL95			0.465						5% KM I		0.427
982							0% KM F		, ,	0.386					95% KM		` '	0.422
983						99	9% KM F	Percent	ile (z)	0.489						95% K	M USL	0.549
984																		
985						DI	J2 Subs			·	stics Assumi	ng Normal D	distribution	1				
986						050	/ LITLOF		Mean	0.26						050/	SD	0.0988
987						95%	% UTL95		•	0.465					050/		UPL (t)	0.427
988								Percent	, ,	0.386					95%	Percer	` ′	0.422
989					DI /2 :-	not c		Percent	` ,	0.49	vided for cor	nnaricono e	nd historia	al ro	eone.	95	% USL	0.55
990					או אוע צו	not a	TECOMIM	i c i iued	metric	u. DDZ pro	viucu ioi coi	iihai isotis gi	iu ilistofic	aı ı e	300115			
991							r.	amma	GOF	Tests on Da	etected Obse	rvations On	v					
992								Test Sta		3.542	liceled Obse		\nderson-	Darlii	na GOF T	est		
993						5	5% A-D C			0.75	n	ata Not Gar					nce l ev	/el
994								Test Sta		0.237			Kolmogor			-	201	
995						F	5% K-S C			0.132	D	ata Not Gar					nce Lev	/el
996											ed at 5% Sigi							
997																		
998								Ga	mma :	Statistics or	Detected Da	ata Onlv						
999								k hat (8.247		· · · · · · · · · · · · · · · · · · ·		k st	ar (bias co	orrecter	d MLE)	7.712
1000								(,	J.LT/				00	\2.00 00	55100	/	12

$\overline{}$	Δ.	Г Б						1		T , T	14	
1001	A	В	С	D The	E ta hat (MLE)	F 0.0328	G	Н	Theta	star (bias corr	K ected MLE)	0.035
1001				n	nu hat (MLE)	742.2				nu star (bias	corrected)	694.1
1002			М	LE Mean (bia	s corrected)	0.27						
1003				MLE Sd (bia	s corrected)	0.0973			95% Perce	ntile of Chisqu	are (2kstar)	25.55
1004						L						
1006				G	amma ROS	Statistics us	sing Imputed	l Non-Detect	s			
1007			GROS may	not be used	when data s	et has > 50%	% NDs with r	many tied ob	servations a	t multiple DLs		
1008		GROS may	y not be used	d when kstar	of detects is	small such a	ıs <1.0, espe	ecially when	the sample s	size is small (e	g., <15-20)	
1009			Fo	or such situati	ons, GROS	method may	yield incorr	ect values of	UCLs and E	BTVs		
1010				Т	his is especi	ally true whe	en the samp	le size is sma	all.			
1011		For gar	nma distribu	ted detected	data, BTVs a	and UCLs ma	ay be compu	uted using ga	mma distrib	ution on KM es	timates	
1012					Minimum	0.04					Mean	0.264
1013					Maximum	0.58					Median	0.26
1014					SD	0.0902					CV	0.342
1015					k hat (MLE)	7.425				star (bias corre	,	6.965
1016					ta hat (MLE)				Theta	star (bias corr	· ·	0.0379
1017					nu hat (MLE)					nu star (bias		654.7
1018				LE Mean (bia	,					MLE Sd (bias	,	0.1
1019			95% Percer	ntile of Chisqu							Percentile	0.398
1020					% Percentile						Percentile	0.551
1021				ollowing stati								
1022				Jpper Limits (i) and Hawk	ins Wixley (F	HW) Methods	S	1401	1.047
1023	050/ 4				WH	HW				0 1101	WH	HW
1024	95% App	rox. Gamma		5% Coverage		0.518		9	5% Approx.	Gamma UPL	0.449	0.458
1025			95% (Gamma USL	0.643	0.675						
1026				Fo	timatas of C	ommo Doror	motoro unino	, KM Estimat				
1027				ES	Mean (KM)		lieters using	J KIVI ESUIIIAU	.62		SD (KM)	0.0989
1028				Va	riance (KM)					SE of	Mean (KM)	0.0365
1029					k hat (KM)						k star (KM)	6.446
1030					nu hat (KM)						u star (KM)	605.9
1031				the	eta hat (KM)						a star (KM)	0.0402
1032			80%	6 gamma per	` ,				90	% gamma pero	` '	0.396
1033				6 gamma per	, ,					% gamma perd	` '	0.554
1034												
1035 1036			The	following sta	tistics are co	mputed usir	ng gamma d	istribution an	d KM estima	ates		
1036				Jpper Limits (•						
1037					WH	HW					WH	HW
1038	95% App	rox. Gamma	UTL with 95	5% Coverage	0.623	0.683		9	5% Approx.	Gamma UPL	0.534	0.574
1040		95	% KM Gamn	na Percentile	0.523	0.56			95%	Gamma USL	0.859	0.99
1041							1					
1042				Lo	gnormal GO	F Test on Do	etected Obs	ervations On	nly			
1043			S	hapiro Wilk T	est Statistic	0.738			Shapiro W	ilk GOF Test		
1044			5% S	hapiro Wilk C	ritical Value	0.945		Data Not	Lognormal	at 5% Significa	nce Level	
1045				Lilliefors T	est Statistic	0.262				GOF Test		
1046			5	% Lilliefors C					Lognormal	at 5% Significa	nce Level	
1047					Data Not L	ognormal at	5% Signific	ance Level				
1048												
1049		В	ackground L	ognormal RC	OS Statistics		ognormal Di	istribution Us	ing Imputed		n Log Scale	-1.403

	А	В		С	D	E		F	G	Н	П		J		K	L	
1051						Original Sc	ale 0	0.0907	<u> </u>				-	SD in	Log Scale	0.42	21
1052					95% UTL	95% Covera	ige (0.589				95%	BCA UT	L95%	Coverage	0.55	;
1053			95% Bo	ootstra	p (%) UTL	95% Covera	ige (0.571						9	5% UPL (t)	0.50)2
1054					909	6 Percentile	(z) (0.422					95	% Pe	ercentile (z)	0.49	1
1055					999	6 Percentile	(z) (0.655							95% USL	0.84	15
1056																	
1057				Statis	stics using	KM estimate	es on Lo	ogged Da	ata and Ass	uming Logno	ormal Di	istribu	ition				
1058					KM Mean	of Logged Da	ata -1	1.512		959	% KM U	TL (L	ognorma	1)95%	6 Coverage	1.14	14
1059					KM SD	of Logged Da	ata (0.794				9	5% KM l	JPL (I	_ognormal	0.84	18
1060			95	5% KM	Percentile	Lognormal	(z) (0.814				9	5% KM (JSL (I	_ognormal)	2.26	32
1061																	
1061					Bad	kground DL	/2 Statis	stics Ass	suming Logn	ormal Distrib	oution						
					Mean ir	Original Sc	ale (0.26					M	ean in	Log Scale	-1.50	1
1063						Original Sca		0.0988							Log Scale		7
1064						95% Covera		1.163							5% UPL (t)		31
1065					909	6 Percentile	(z) (0.619					95	5% Pe	ercentile (z)	0.82	26
1066						6 Percentile	` /	1.422							95% USL)5
1067			DL	./2 is n			` '		vided for cor	nparisons ar	nd histo	rical r	easons.				
1068								•		•							
1069						Nonparamet	tric Distr	ribution I	Free Backgr	ound Statisti	cs						
1070						•				bution (0.05)							
1071																	
1072			No	onpara	metric Upi	er Limits for	·BTVs(r	no distin	ction made l	between det	ects and	d none	detects)				
1073						er of Statistic		16						th95%	Coverage	0.55	
1074			Approx.	f used		te achieved (1.211	Approxima	nte Actual Co	nfidenc				•		
1075	Annrovi				•	e specified		93							95% UPL		
1076		•				95% U		0.58				ç	95% KM	Cheb	yshev UPL)5
1077																	
1078		Note: Th	ne use o	f USL	tends to vi	eld a conser	vative e	estimate	of BTV, esp	ecially when	the sar	nple s	size start	s exc	eeding 20.		
1079									•	epresents a		•					
1080							•			n unimpacte	_						
1081			The use	e of US	SL tends to	provide a ba	alance b	between	false positiv	es and false	negativ	ves pr	ovided t	he da	ta		
1082 1083						•				ations need t	_						
1083			•									•					
	MANGANE	SE, DISSO	DLVED														
1086																	
	General St	atistics															
				Total	Number of	of Observation	ons 1	12			Νι	ımber	of Distin	nct Ob	servations	9	
1088											Nι	ımber	of Missi	ng Ob	servations	34	
1089						Minim	um (0.11							rst Quartile		38
1090						Second Large	est (0.32							Median	0.25	55
1091						Maximi		0.57						Thi	ird Quartile		
1092						Me		0.281							SD		
1093					Coeffici	ent of Variati		0.385							Skewness		
1094						of logged Da		1.333					SI	D of Ic	ogged Data		
1095																	
1096					(Critical Value	s for Ba	ackgroun	nd Threshold	l Values (BT	Vs)						_
1097				Tole		tor K (For U		2.736		•				d2ma	x (for USL)	2.28	35
1098						, -	-								. ,		
1099							N	Normal G	OF Test								
1100							•										

	Α	В	С	D Shapiro Wilk	E est Statistic	F 0.818	G	Н	Shaniro Wi	J lk GOF Test	K	L
1101				Shapiro Wilk C		0.859		Data No	•	5% Significan	ice I evel	
1102					Test Statistic	0.275		- Data No		GOF Test		
1103				5% Lilliefors C		0.243		Data No		5% Significan	ice I evel	
1104							 % Significan		, ritorinar ac	o 70 Olgriiilodii		
1105					244 1101	- Tomiai ac o	70 Giginiioan					
1106				В	ackground S	tatistics Ass	uming Norma	al Distributio	n			
1107			95%	UTL with 95					•	90% P	ercentile (z)	0.419
1108					95% UPL (t)	0.483					Percentile (z)	0.459
1109					95% USL	0.528					Percentile (z)	0.532
1110						0.020					(2)	
1111						Gamma (GOF Test					
1112				A-D T	Test Statistic	0.71		Andei	rson-Darling	Gamma GOF	- Test	
1113					Critical Value	0.731	Detecte		•	istributed at 5		ce l evel
1114					Test Statistic	0.227	Dottoolo			v Gamma GC		
1115					Critical Value	0.246	Detecte	_		istributed at 5		ce l evel
1116					data appear							
1117												
1118						Gamma	Statistics					
1119					k hat (MLE)	8.062			k	star (bias cori	rected MLE)	6.102
1120				The	ta hat (MLE)	0.0348				star (bias cor	,	0.046
1121					nu hat (MLE)	193.5					s corrected)	146.5
1122			N	/ILE Mean (bia		0.281				MLE Sd (bia	,	0.114
1123												
1124				Ba	ackground St	atistics Assu	ıming Gamm	na Distributio	on .			
1125		95% Wilso	on Hilferty (WH) Approx. (-	0.503				909	% Percentile	0.433
1126 1127		95% Hawkii	ns Wixley (HW) Approx. (Gamma UPL	0.509				959	% Percentile	0.49
1127	9:			UTL with 95		0.647				999	% Percentile	0.61
1129	9.	5% HW Appro	ox. Gamma	UTL with 95	% Coverage	0.664						
1130				9	5% WH USL	0.569				95	5% HW USL	0.58
1131												
1132						Lognormal	GOF Test					
1133				Shapiro Wilk	Test Statistic	0.881		Shap	oiro Wilk Log	normal GOF	Test	
1134			5% 9	Shapiro Wilk C	Critical Value	0.859		Data appea	ar Lognormal	l at 5% Signifi	icance Level	
1135				Lilliefors	Test Statistic	0.22		Lil	liefors Logno	ormal GOF Te	est	
1136				5% Lilliefors C	Critical Value	0.243		Data appea	ar Lognormal	l at 5% Signifi	cance Level	
1137					Data appear	Lognormal	at 5% Signifi	cance Level				
1138												
1139				Bac	ckground Sta	tistics assun	ning Lognorr	nal Distributi	ion			
1140			95%	UTL with 95	% Coverage	0.739				90% P	ercentile (z)	0.427
1141					95% UPL (t)	0.533				95% P	Percentile (z)	0.49
1142					95% USL	0.623				99% P	ercentile (z)	0.633
1143						<u> </u>	I					
1144				No	nparametric	Distribution	Free Backgro	ound Statisti	cs			
1145				Data	appear Gan	nma Distribu	ted at 5% Si	gnificance L	evel			
1146												
1147				Nonpa	rametric Upp	er Limits for	Background	Threshold \	/alues			
1148				Order	of Statistic, r	12			95%	UTL with 95°	% Coverage	0.57
1149		Ap	prox, f use	d to compute a	achieved CC	0.632	Approxima	ite Actual Co	onfidence Co	efficient achie	eved by UTL	0.46
1150							Approxin	nate Sample	Size neede	d to achieve s	specified CC	59
00												

	A B C D E	F	G H I J K L	
1151	95% Percentile Bootstrap UTL with 95% Coverage	0.57	95% BCA Bootstrap UTL with 95% Coverage 0.8	
1152	95% UPL	0.57		319
1153	90% Chebyshev UPL	0.618		433
1154	95% Chebyshev UPL	0.771	99% Percentile 0.5	543
1155	95% USL	0.57		
1156			(07)	
1157			of BTV, especially when the sample size starts exceeding 20.	
1158			ne data set represents a background data set free of outliers	
1159			ed from clean unimpacted locations.	
1160			false positives and false negatives provided the data	
1161	represents a background data set and w	nen many o	nsite observations need to be compared with the BTV.	
1162	NITRATE-NITROGEN			
1163	NITATE-NITAGEN			
1164	General Statistics			
1165	Total Number of Observations	46	Number of Distinct Observations 38	
1166	Total Number of Observations		Number of Missing Observations 1	
1167	Minimum	4.9		.85
1168	Second Largest	29	Median 22.	
1169	Maximum	31.7	Third Quartile 25.	
1170	Mean	21.06		261
1171	Coefficient of Variation	0.297	Skewness -1.0	
1172	Mean of logged Data	2.983	SD of logged Data 0.4	406
1173 1174				
1175	Critical Values for	or Backgrour	nd Threshold Values (BTVs)	
1176	Tolerance Factor K (For UTL)	2.079	d2max (for USL) 2.9	924
1177				
1178		Normal (GOF Test	
1179	Shapiro Wilk Test Statistic	0.898	Shapiro Wilk GOF Test	
1180	5% Shapiro Wilk Critical Value	0.945	Data Not Normal at 5% Significance Level	
1181	Lilliefors Test Statistic	0.181	Lilliefors GOF Test	
1182	5% Lilliefors Critical Value	0.129	Data Not Normal at 5% Significance Level	
1183	Data Not	Normal at 5	% Significance Level	
1184				
1185	Background St	tatistics Ass	uming Normal Distribution	
1186	95% UTL with 95% Coverage		90% Percentile (z) 29.	
1187	95% UPL (t)	31.69		.36
1188	95% USL	39.37	99% Percentile (z) 35.	.63
1189				
1190			GOF Test	
1191	A-D Test Statistic	3.025	Anderson-Darling Gamma GOF Test	
1192	5% A-D Critical Value	0.751	Data Not Gamma Distributed at 5% Significance Level	
1193	K-S Test Statistic	0.24	Kolmogorov-Smirnov Gamma GOF Test	
1194	5% K-S Critical Value	0.131	Data Not Gamma Distributed at 5% Significance Level	
1195	Data Not Gamn	na Distribute	d at 5% Significance Level	
1196		0	Okasiakiaa	
1197			Statistics	422
1198	k hat (MLE)			432
1199	Theta hat (MLE)	2.655		834
1200	nu hat (MLE)	730	nu star (bias corrected) 683.	./

	Δ.																1/	
1001	A		В		С	MLE	D Mean	(bias d	E corrected)	F 21.06	G	Н	<u> </u>	N	J /ILE Sd	(bias c	K corrected)	7.726
1201																		
1202								Back	around S	tatistics Ass	uming Gamm	na Distribution	<u> </u>					
1203			95% Wi	Ison	Hilfertv	(WH) Annro		mma UPL				•			90% F	Percentile	31.37
1204						•			mma UPL								Percentile	35.17
1205					-	•			Coverage								Percentile	43.06
1206									Coverage							33 /0 F	ercerine	43.00
1207		90 /0	пи др	piox.	Gaiiiii	ia U i	L WIUI		WH USL							050/	HW USL	52.74
1208								95%	WH USL	50.10						95%	HW USL	32.74
1209										1	LOOF Task							
1210						Ol		:0. T	1.01-1:-1:		I GOF Test	Oham	! \A/!!!. I	1	l <i>C</i>	OF T-	_4	
1211					F0/		•		st Statistic			•	iro Wilk I					
1212					5%	Sha	•		cal Value			Data Not I	•		•			
1213									t Statistic				iefors Lo	-				
1214						5%	Lilliefo		cal Value			Data Not L	_ognorma	al at !	5% Sig	nificano	ce Level	
1215									Data Not I	ognormal at	5% Significa	ance Level						
1216																		
1217								_			ming Lognorr	mal Distribution	on					
1218					95	% UT	L with		Coverage								centile (z)	33.24
1219								95	% UPL (t)	39.36					95	% Per	centile (z)	38.53
1220									95% USL	64.79					99	% Per	centile (z)	50.82
1221																		
1222								Nonp	arametric	Distribution	Free Backgr	ound Statistic	s					
1223								Dat	a do not f	ollow a Disc	ernible Distri	bution (0.05)						
1224																		
1225							No	nparan	netric Up	per Limits for	Background	Threshold V	alues					
1226							Or	der of S	Statistic, r	45			95	5% U	ΓL with	95%	Coverage	29
1227				Appr	ox, f us	ed to	comp	ite ach	ieved CC	1.184	Approxima	nte Actual Co	nfidence	Coef	ficient a	achieve	ed by UTL	0.677
1228											Approxir	mate Sample	Size nee	eded	to achie	eve spe	cified CC	93
1229		95%	6 Percen	tile E	Bootstra	ap UT	L with	95%	Coverage	31.03		95% BCA	Bootstra	ap U	TL with	95%	Coverage	30.73
1230									95% UPL	28.58						90% F	Percentile	26.7
1231							90% (Chebys	shev UPL	40.05						95% F	Percentile	27.63
1232							95% (Chebys	shev UPL	48.65						99% F	Percentile	30.49
1233									95% USL	31.7								
1234											1							
			Note: Th	ne us	e of US	SL ter	ids to y	ield a	conserva	tive estimate	of BTV, esp	ecially when t	the samp	ole siz	ze start	s exce	eding 20.	
1235												epresents a b						
1236												n unimpacted						
1237				The	use of							es and false			vided t	he data	<u> </u>	
1238								•			<u> </u>	ations need to						
1239							31									•		
1240	pH-FIEL	D																
1241	, · · · · · · · · · · · · · · · · ·																	
1242	General	Static	stice															
1243	Jones	Juli			Т	ntal N	umher	of Obs	ervations	46			Num	nher (of Dietir	nct Obc	ervations	39
1244					10	rui IV	annoei	J1 ODS	oi vautiti	70							ervations	1
1245									Minimum	3.91			inuiti	inel (n wiissi		t Quartile	4.55
1246																FIIS		4.55
1247									d Largest							T 1 ·	Median	
1248								l	Maximum							Third	d Quartile	5.143
1249									Mean							_	SD	0.669
1250							Coeffic	ient of	Variation	0.135						S	Skewness	1.711

	A B C D E	F	G	Н	ı	J K	l ı
1251	Mean of logged Data	1.594	G	П	ı	SD of logged Data	0.124
1252							
1253	Critical Values for	r Backgroui	nd Threshold	Values (BTV	/s)		
1254	Tolerance Factor K (For UTL)	2.079				d2max (for USL)	2.924
1255			II.				I
1256		Normal (GOF Test				
1257	Shapiro Wilk Test Statistic	0.834			Shapiro Wil	k GOF Test	
1258	5% Shapiro Wilk Critical Value	0.945		Data No	t Normal at 5	5% Significance Level	
1259	Lilliefors Test Statistic	0.196			Lilliefors	GOF Test	
1260	5% Lilliefors Critical Value	0.129		Data No	t Normal at 5	5% Significance Level	
1261	Data Not	Normal at 5	% Significan	ce Level			
1262							
1263	Background St	tatistics Ass	uming Norma	al Distribution)		
1264	95% UTL with 95% Coverage	6.353				90% Percentile (z)	5.82
1265	95% UPL (t)	6.098				95% Percentile (z)	6.063
1266	95% USL	6.918				99% Percentile (z)	6.518
1267							
1268			GOF Test				
1269	A-D Test Statistic	2.374			-	Gamma GOF Test	
1270	5% A-D Critical Value	0.747	Da			ed at 5% Significance Le	vel
1271	K-S Test Statistic	0.197				v Gamma GOF Test	
1272	5% K-S Critical Value	0.13				ed at 5% Significance Le	vel
1273	Data Not Gamn	na Distribute	ed at 5% Sign	nificance Leve	el		
1274							
1275			Statistics				
1276	k hat (MLE)	63.2				star (bias corrected MLE)	59.09
1277	Theta hat (MLE)	0.0785			Theta	star (bias corrected MLE)	0.084
1278	nu hat (MLE)	5814				nu star (bias corrected)	5436
1279	MLE Mean (bias corrected)	4.963				MLE Sd (bias corrected)	0.646
1280							
1281	Background St		uming Gamm	a Distribution	n		
1282	95% Wilson Hilferty (WH) Approx. Gamma UPL	6.082				90% Percentile	
1283	95% Hawkins Wixley (HW) Approx. Gamma UPL	6.081				95% Percentile	6.07
1284	95% WH Approx. Gamma UTL with 95% Coverage	6.362				99% Percentile	6.587
1285	95% HW Approx. Gamma UTL with 95% Coverage	6.365				050/ 104/1101	7.007
1286	95% WH USL	7.013				95% HW USL	7.027
1287		1	1005 T+				
1288	Objective Main, Teast Oc. 2012		I GOF Test	Ob	ino \Affilia I = ···	normal COE Tast	
1289	Shapiro Wilk Critical Value	0.879		·		normal GOF Test	
1290	5% Shapiro Wilk Critical Value	0.945				t 5% Significance Level	
1291	Lilliefors Test Statistic	0.193				rmal GOF Test	
1292	5% Lilliefors Critical Value		5% Significa		Logriormai a	t 5% Significance Level	
1293	Data Not Li	ognomiai at	J70 SIGNIIICA	IIICE LEVEI			
1294	Background Sta	tietico coo:	ning Lognor	nal Diotribust	nn .		
1295	95% UTL with 95% Coverage	6.372	mily Lognom	וואווטונוט ויאווטונוט	ווע	90% Percentile (z)	5.772
1296	95% UTL With 95% Coverage 95% UPL (t)	6.078				95% Percentile (z)	6.038
1297	95% UPL (t) 95% USL	7.076				95% Percentile (z)	6.571
1298	95% USL	7.076				33 % Percentile (Z)	0.3/1
1299	Namagematic	Dietributie:	Eroo Books	nund Ctatiotic	ne .		
1300	Nonparametric	DISH IDUTION	riee backgro	วนาน อเสเเรเเต	<i>,</i> 5		

		_	1	_			-				· · ·	-		1			17	$\overline{}$	
1301	A	В		С		D		E o not fo	F ollow a Disc	G ernible Dist	H ribution (0	0.05)	<u> </u>		J		K		L
1302																			
1303						Nonpa	arametr	ic Uppe	er Limits fo	Backgrour	nd Thresh	old Va	lues						
1304						Order	of Stat	istic, r	45				95	% UTI	_ with	95%	Covera	ge	6.55
1305			Approx,	f use	d to con	npute	achieve	ed CC	1.184	Approxim	nate Actua	al Conf	idence	Coeffic	cient a	chiev	ed by U	TL	0.677
1306										Approx	imate Sa	mple S	ize nee	eded to	achie	ve sp	ecified (CC	93
1307	95	5% Percer	ntile Boo	tstrap	UTL w	ith 95	5% Cov	/erage	7.175		95%	BCA I	Bootstra	ap UTI	L with	95%	Covera	ge	7.068
1308							95%	6 UPL	6.491							90%	Percent	ile	5.8
1309					90	% Che	ebyshev	v UPL	6.99							95%	Percent	ile	6.273
1310					95	% Che	ebyshev	v UPL	7.909							99%	Percent	ile	7.04
1311							95%	6 USL	7.44										
1312																			
1313		Note: Th	he use o	f USL	tends t	to yield	d a con	servativ	ve estimate	of BTV, es	pecially w	hen th	e samp	le size	starts	exce	eding 2	0.	
1314		Therefo	ore, one	may ı	ıse USI	L to es	timate	a BTV	only when	he data set	represen	its a ba	ckgrou	nd dat	a set	free o	foutlier	S	
1315					and	consis	sts of o	bserva	tions collec	ted from cle	ean unimp	acted	location	ns.					
1316			The use	e of U	SL tend	ls to p	rovide a	a balan	ice betweer	false posit	ives and	false n	egative	s provi	ided th	e data	а		
1317			represe	nts a l	oackgro	ound d	ata set	and wh	nen many o	nsite obser	vations ne	eed to	be com	pared	with th	e BT\	/ .		
1318																			
1319	pH-LAB																		
1320																			
	General Sta	itistics																	
1322				Tota	al Numb	per of (Observa	ations	46				Num	nber of	Distin	ct Obs	servatio	ns	41
1323													Num	ber of	Missir	g Ob	servatio	ns	1
1324							Min	nimum	4.81							Fire	st Quart	ile	5.36
1325						Sec	cond La	argest	9.33								Medi	an	5.57
1326							Max	kimum	9.42							Thir	d Quart	ile	5.763
1327								Mean	5.817								5	SD	0.968
1328					Coe	efficien	nt of Var	riation	0.166							;	Skewne	SS	2.521
1329					M	ean of	f logged	d Data	1.75						SD	of lo	gged Da	ata	0.143
1330																			
1331									•	nd Thresho	ld Values	(BTVs	s)						
1332				Tol	erance	Factor	r K (For	· UTL)	2.079						C	l2max	(for US	SL)	2.924
1333																			
1334									Normal	GOF Test									
1335					•		Test St		0.694				Shapiro						
1336				5% \$			Critical		0.945		Dat	ta Not I	Normal				e Level		
1337							Test St		0.291				Lilliefo						
1338					5% Lilli	efors (Critical		0.129				Normal	at 5%	Signif	icance	e Level		
1339							Da	ta Not	Normal at 5	% Significa	ince Leve	el							
1340																			
1341										uming Norr	nal Distrib	oution							
1342				95%	UTL w	ith 95	5% Cov	_	7.83								centile	` '	7.058
1343							95% U		7.46								centile	` '	7.409
1344							95%	USL	8.648						99	% Per	centile	(z)	8.069
1345											_								
1346										GOF Test									
1347							Test St		4.126				on-Darli						
1348					5%		Critical		0.748		Data Not							Leve	
1349							Test St		0.269				ov-Smi						
1350					5%	6 K-S	Critical	Value	0.13		Data Not	Gamm	a Distri	ibuted	at 5%	Signif	ficance	Leve	1

_	Α.	Г.	1 ^	1 -				T		, , ,	17	
1251	A	В	С	D	Data Not Ga	F mma Distribut	G ed at 5% Sig	H nificance Lev	rel	J	K	L
1351 1352												
						Gamma	Statistics					
1353					k hat (ML	E) 45.34			k	star (bias corr	rected MLE)	42.4
1354 1355					heta hat (ML	E) 0.128			Theta	star (bias corr	rected MLE)	0.137
1356					nu hat (ML	E) 4171				nu star (bia	s corrected)	3900
1357			M	ILE Mean	(bias correcte	d) 5.817				MLE Sd (bia	s corrected)	0.893
1358												
1359					Background	Statistics Ass	uming Gamn	na Distributio	n			
1360		95% Wils	on Hilferty (V	VH) Appro	x. Gamma Ul	PL 7.376				90%	% Percentile	6.987
1361		95% Hawk	ins Wixley (F	HW) Appro	x. Gamma Uf	PL 7.366				95%	% Percentile	7.36
1362	9	5% WH Appr	ox. Gamma	UTL with	95% Covera	ge 7.773				99%	% Percentile	8.094
1363	9	5% HW Appr	ox. Gamma	UTL with	95% Covera	ge 7.767						
1364					95% WH US	SL 8.702				95	5% HW USL	8.712
1365						'						
1366						Lognorma	I GOF Test					
1367				-	ilk Test Statis			•	_	gnormal GOF		
1368			5% S	Shapiro Wi	lk Critical Val	ue 0.945			_	at 5% Significa		
1369				Lilliefo	rs Test Statis					ormal GOF Te		
1370			5	5% Lilliefor	s Critical Valu				Lognormal a	at 5% Significa	ance Level	
1371					Data No	t Lognormal a	t 5% Significa	ance Level				
1372												
1373					_	Statistics assu	ming Lognori	mal Distributi	ion			T.
1374			95%	UTL with	95% Covera						ercentile (z)	6.913
1375					95% UPL	. ,					ercentile (z)	7.283
1376					95% US	SL 8.749				99% P	ercentile (z)	8.03
1377												
1378					· ·	ic Distribution	-					
1379					Data do no	t follow a Disc	emible Distri	bution (0.05))			
1380				Man		mman limita fa	n Da alemane	I Thus should \	/aluan			
1381					ler of Statistic	pper Limits fo	r Background	i inresnoia v		LITE WAS OF	0/ 0	0.00
1382		Λ.				'	A	-		UTL with 959	•	
1383		A	pprox, r used	to compu	te achieved C	C 1.184				efficient achie	•	0.677
1384		NEO/ Davasati	la Da statuan	LITIiala	OEN/ Carrana	0.200	Approxii			d to achieve substruction to the distribution of the distribution		93 9.33
1385	*	95% Percenui	е воосыар	OTE WILL	95% Covera	-		95% BC/	А Бооізпар			6.845
1386				000/ 0	95% UF Chebyshev UF						% Percentile % Percentile	7.668
1387					Chebyshev UF						% Percentile	9.38
1388				30% (95% US					99 7	o Fercentile	5.30
1389					33 /0 U	J.42						
1390		Note: The	use of HSI	tends to v	ield a consen	rative estimate	of BTV esp	ecially when	the sample	size starts exc	ceeding 20	
1391							•		•	data set free		
1392			., 55 may u			rvations collec		<u> </u>				
1393		Т	he use of US					•		provided the da	 ata	
1394										red with the B		
1395			,	- 9.50.10								
1396		JM, TOTAL										
1397		,										
1398 1399	General St	atistics										
1399			Tota	I Number	of Observation	ns 45			Numbe	er of Distinct O	bservations	17
1400							1					<u> </u>

		-1		-		-		-						
1401	A		В		С		D		E	F	G	Н	I J K Number of Missing Observations	L 2
1401									Minimum	0.95			First Quartile	1.2
1402							S	ecor	nd Largest	14.4			Median	1.3
1403									Maximum				Third Quartile	1.9
1404									Mean	5.066			SD	19.53
1405							Coefficie	ent o	f Variation				Skewness	6.529
1406							Mean	of lo	gged Data	0.583			SD of logged Data	0.901
1407 1408														
1409							С	ritica	al Values f	or Backgrou	nd Threshold	Values (BT	Vs)	
1410					-	Tolera	nce Fact	or K	(For UTL)	2.085			d2max (for USL)	2.915
1411														
1412										Normal (GOF Test			
1413						Sh	apiro Will	k Te	st Statistic	0.214			Shapiro Wilk GOF Test	
1414					5	% Sha	apiro Wilk	Crit	tical Value	0.945		Data No	ot Normal at 5% Significance Level	
1415							Lilliefors	s Te	st Statistic	0.429			Lilliefors GOF Test	
1416						5%	Lilliefors	Crit	tical Value	0.131		Data No	ot Normal at 5% Significance Level	
1417									Data No	Normal at 5	% Significan	ce Level		
1418														
1419								Bac	kground S	Statistics Ass	uming Norma	al Distribution	n	
1420					9	5% U	ΓL with	95%	Coverage	45.78			90% Percentile (z)	30.09
1421								95	5% UPL (t)	38.24			95% Percentile (z)	37.19
1422									95% USL	62			99% Percentile (z)	50.49
1423														
1424										Gamma	GOF Test			
1425							A-D) Te	st Statistic	10.08		Ander	rson-Darling Gamma GOF Test	
1426							5% A-D	Crit	tical Value	0.804	D	ata Not Gam	nma Distributed at 5% Significance Leve	el
1427							K-9	S Te	st Statistic	0.377		Kolmog	orov-Smirnov Gamma GOF Test	
1428							5% K-S	Crit	tical Value	0.138	D	ata Not Gam	nma Distributed at 5% Significance Leve	el
1429								Data	Not Gami	ma Distribute	ed at 5% Sign	nificance Lev	/el	
1430														
1431											Statistics			
1432									hat (MLE)				k star (bias corrected MLE)	0.57
1433							Th		hat (MLE)				Theta star (bias corrected MLE)	8.883
1434									hat (MLE)				nu star (bias corrected)	51.32
1435						MLE	E Mean (b	oias	corrected)	5.066			MLE Sd (bias corrected)	6.708
1436														
1437									-		uming Gamm	na Distributio		
1438						• •	,		ımma UPL				90% Percentile	13.32
1439						• •	,		mma UPL				95% Percentile	18.56
1440				•					Coverage				99% Percentile	31.29
1441	(95%	HW Ap	prox	. Gam	ma U	TL with		Coverage					
1442								95%	6 WH USL	33.08			95% HW USL	30.28
1443														
1444											I GOF Test			
1445							•		st Statistic			•	piro Wilk Lognormal GOF Test	
1446					5	% Sha	•		tical Value				Lognormal at 5% Significance Level	
1447						F.0.			st Statistic				liefors Lognormal GOF Test	
1448						5%	Lilliefors		tical Value		F0/ 6' '5		Lognormal at 5% Significance Level	
1449									∪ata Not L	.ognormal at	: 5% Significa	ance Level		
1450														

	Α	В	С	D	E	F	G	Н		J	K	L
1451			050/		Background S		ming Lognor	mal Distribu	ition	000/ 5		5.005
1452			95%	U I L with	95% Coveraç						Percentile (z)	
1453					95% UPL						Percentile (z) Percentile (z)	
1454					95% US	DL 24.78				99% F	rercentile (z)	14.58
1455					Nonparametr	io Dietribution	Eroo Booka	round Statio	tion			
1456					-	t follow a Disc	_					
1457					Data do 110	t lollow a Disc	errible Distr	ibulion (o.o.	· ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '			
1458				No	nparametric U	nner I imits fo	r Background	d Threshold	Values			
1459					der of Statistic		Dackground	u mesnou		UTL with 95	% Coverage	14.4
1460		An	nrox fusec		ite achieved C		Approxima	ate Actual C		oefficient achi		
1461		7.4		- 10 00pc						ed to achieve		
1462	OI	5% Percentile	e Bootstrap	UTL with	95% Coverage	ge 108.5	1 1			UTL with 95	·	
1463					95% UF						% Percentile	
1464				90% (Chebyshev UF						% Percentile	
1465					Chebyshev UF						% Percentile	
1466 1467					95% US	SL 132						
1468												
1469		Note: The	use of USL	tends to y	rield a conserv	ative estimate	e of BTV, esp	pecially whe	n the sample	size starts ex	ceeding 20.	
1470		Therefore,	, one may u	ise USL to	estimate a B	V only when	the data set	represents a	a background	d data set free	of outliers	
1471				and co	nsists of obse	vations collec	ted from clea	an unimpact	ted locations			
1472		Th	ne use of US	SL tends to	o provide a ba	lance betwee	n false positi	ves and fals	e negatives	provided the d	ata	
1473		rep	oresents a b	ackgroun	d data set and	when many o	nsite observ	ations need	to be compa	ared with the E	BTV.	
1474												
1475	DOTACOLL	M, DISSOLV	ED									
1476												
1477	General Sta	ntistics										
1478			Tota	l Number	of Observation	ns 12			Numb	er of Distinct (Observations	8
1479									Numbe	er of Missing (Observations	34
1480					Minimu					Ī	First Quartile	
1481					Second Large						Median	
1482					Maximu					Т	hird Quartile	
1483					Mea						SD	
1484					eient of Variation						Skewness	
1485				Mear	n of logged Da	ta 0.373				SD of	logged Data	0.672
1486												
1487					Critical Values		nd Threshold	d Values (B	TVs)	10	(6 1101)	0.005
1488			lole	erance Fa	ctor K (For UT	L) 2.736				d2m	ax (for USL)	2.285
1489						NI a 1	COE T+					
1490				Ol ' \ \	:::: T+ O+-+:		GOF Test		Ob a mina M	##- 00F T+		
1491					ilk Test Statist			Deta 1	•	/ilk GOF Test	noo I ayal	
1492			5% 5		ilk Critical Valu			Data N		t 5% Significar	ice Level	
1493			1		rs Critical Valu			Data N		t 5% Significa	nce I evol	
1494				J /O LIIIIEIO		ot Normal at	5% Significa		vot ivollilai äl	co /o oigililical	ICE LEVEI	
1495					Data N	or Hormar at i	o o organical	IIOG LEVEI				
1496						Statistics Ass	suming Norm	nal Dietributi	on			
1497			05%		Rackground	しにはいること べい	aning NOIT		UII			
1498	I			LITL with	Background	10 12				Q00/_ F	Percentile (3)	5 2/6
				UTL with	95% Coveraç						Percentile (z)	
1499 1500			9576	UTL with		(t) 7.578				95% F	Percentile (z) Percentile (z) Percentile (z)	6.917

	Α	В	T	С	Т	D	Т	E	F		G	Н			J	l	Т	K	Т	L
1501									- 1											
1502					-				Gamm	na GO	F Test									
1503					-	A-E) Tes	st Statistic	2.705	i		And	erson-Da	arling (Gamma	a GOI	F Tes	st		
1504					-	5% A-D) Crit	tical Value	0.745	i	Е	ata Not Ga	mma Dis	stribut	ed at 5°	% Sig	jnifica	ance Lo	evel	
1505						K-5	S Tes	st Statistic	0.43			Kolmo	gorov-S	mirno	v Gamr	ma G	OF T	est		
1506						5% K-S	3 Crit	tical Value	0.249)		ata Not Ga	mma Dis	stribut	ed at 5	% Sig	jnifica	ance Lo	evel	
1507						-	Data	Not Gam	ma Distrib	uted a	at 5% Sig	nificance Le	evel							
1508																				
1509									Gamm	na Sta	atistics									
1510							k	hat (MLE	1.554					k s	star (bia	as cor	recte	ed MLE)	1.221
1511						Th	neta	hat (MLE	1.332				T	heta s	star (bia	as cor	rrecte	ed MLE	.)	1.695
1512							nu	hat (MLE	37.31						nu sta	ar (bia	as co	rrected)	29.31
1513				ı	MLE	Mean (b	oias (corrected) 2.071						MLE S	d (bia	as co	rrected	i)	1.874
1514																				
1515							Back	kground S	Statistics As	ssumi	ng Gamr	na Distribut	ion							
1516		95% Wil	Ison H	lilferty ((WH)	Approx	. Ga	mma UPI	5.973	1						90	% Pe	ercentile	е	4.538
1517		95% Haw	kins V	Vixley ((HW)	Approx	. Ga	mma UPI	5.75							95	% Pe	ercentile	е	5.785
1518	95	5% WH App	prox. (Gamma	a UTI	_ with	95%	Coverage	9.471							99	% Pe	ercentile	е	8.638
1519	95	5% HW App	prox. (Gamma	a UTI	_ with	95%	Coverage	9.378	;							_			
1520							95%	WH USI	7.517	'						9	5% H	HW USI	L	7.325
1521																				
1522									Lognorn	nal G	OF Test									
1523					Sha	piro Will	k Tes	st Statistic	0.569)		Sha	apiro Wil	k Logi	normal	GOF	Test	:		
1524				5%	Shap	oiro Wilk	(Crit	tical Value	0.859)		Data No	t Lognor	mal at	t 5% Si	gnific	ance	Level		
1525						Lilliefors	s Tes	st Statistic	0.359)		L	illiefors l	Logno	rmal G	OF To	est			
1526					5% I	Lilliefors		tical Value				Data No	t Lognor	mal at	t 5% Si	gnific	ance	Level		
1527								Data Not	Lognormal	at 5%	6 Signific	ance Level								
1528																				
1529											g Lognor	mal Distribu	ition							
1530				95%	5 UTI	_ with 9		Coverage										entile (z		3.435
1531								5% UPL (t										entile (z	1	4.384
1532								95% USI	6.739)						99% F	erce.	entile (z	.)	6.929
1533																				
1534							-				-	ound Statis								
1535							Dat	ta do not	follow a Dis	scem	ible Distri	bution (0.0	5)							
1536																				
1537									-	tor Ba	ckground	d Threshold		050/ 1	ITI is	L 05	-0/ 0			11 1
1538			•	•				Statistic,										overag		11.4
1539		,	Appro	x, t use	a to	compute	e acr	hieved CC	0.632	: P	• •	ate Actual C								0.46
1540		E0/ Dam-	uil - D		י דו	ا المانين	OE0/	Co	- 114		Approxi	mate Samp					•			59
1541	9:	5% Percen	iale Ro	oustrap	ווטנ	_ with S						95% B(CA Boots	ыгар С	J I ∟ WIt					11.4
1542						000/ 0		95% UPL										ercentile		1.6
1543								shev UPL										ercentile		6.01
1544						95% Cl		shev UPL								99	% Pe	ercentile	J	10.32
1545								95% USI	11.4											
1546		Note: TI	10.115	offici	40-	do to of	<u> </u>	00000	tivo catina -	to of	DT\/	- طب بالمامة	n tha ar	male -	izo etc	rte cu		line 20		
1547												ecially whe		-				_	· ——	
1548		i nereto	ne, on	е тау					-			represents an unimpact			uata Se	и пес	; UI 0	uners		
1549			The	100 of 1								•			ovide d	the d	lote			
1550			i ne u	ise of U	JOL to	enus to	brov	iue a bala	ince detwe	en tal	ise positiv	ves and fals	e negati	ves pr	ovided	me d	ata			

	Α		В		С		D	Е		F	G	Н	I		J	ŀ	K	L
1551				represe	nts a b	ackgro	ound da	ita set a	nd wh	nen many o	nsite observa	ations need t	o be com	pared v	vith the E	BTV.		
1552																		
1553	SODIUM	, TOTA	۱L															
1554																		
1555	General	Statisti	cs															
1556					Total	l Num	ber of C	bservat	ions	45			Num	ber of I	Distinct (Observ	ations	35
1557													Num	ber of N	Missing (Observ	ations	2
1558								Minin	num	13.3						First Q	uartile	14.4
1559							Sec	ond Lar	gest	27.5						M	ledian	15.5
1560								Maxin	num	54.2					T	Third Q	uartile	18.5
1561								N	lean	17.5							SD	6.329
1562						Coe	efficient	of Varia	ation	0.362						Skev	wness	4.712
1563						N	lean of	logged I	Data	2.826					SD of	flogged	d Data	0.24
1564																		
							Crit	ical Valu	ies foi	r Backgrour	d Threshold	Values (BT\	/s)					
1565	i				Tole	erance		K (For l		2.085		•	•		d2n	nax (for	USL)	2.915
1566								•	′							`	,	
1567										Normal (OF Test							
1568					S	Shapiro	o Wilk T	est Stat	tistic	0.524			Shapiro	Wilk G	OF Test			
1569						•		ritical V		0.945		Data No	t Normal				vel	
1570								est Stat		0.253				ors GOF				
1571					5			ritical V		0.131		Data No	t Normal	at 5% S	Significa	nce Le	vel	
1572											% Significan				- 9			
1573										Tomal at o	70 Olgrillodir							
1574							B	ackarou	nd Sta	atistics Ass	ımina Norma	al Distribution	n					
1575					95%	UTI w		% Cove		30.7	anning recent				90% (Percent	tile (z)	25.61
1576						0.2.		95% UP	·	28.25						Percent	` '	27.91
1577								95% U	` '	35.95						Percent	` '	32.22
1578															00701	010011	o (<u>_</u>)	02.22
1579										Gamma	GOF Test							
1580							A-D T	est Stat	tistic	3.717		Ander	son-Darli	na Gan	nma GO	F Test		
1581						59		ritical V		0.748	D	ata Not Gam		-				ام
1582						- 07		est Stat		0.193			orov-Smi		`	-		
1583						59		ritical V		0.132	D	ata Not Gam						ام
1584												nificance Lev				griiioai	.00 201	
1585																		
1586										Gamma	Statistics							
1587								k hat (N	(LF)	14				k star	(bias co	rrected	MI F)	13.08
1588							The	ta hat (N		1.25			The		(bias co		,	1.338
1589								nu hat (N		1260			1110		ı star (bi		,	1178
1590					M	II F Ma		s correc		17.5					E Sd (bia		<i>'</i>	4.838
1591					IVI	ILL IVIE	Jan (Did	13 COLLEC	icu)	17.5				IVIL	_ Ou (Di	us com	cci c u)	4.000
1592							D.	ackarou	nd Sta	atistice Aee	ımina Gamm	na Distributio	n					
1593		OI	5% \A	Vilson Hil	lforty (\A	ΛΗ Λ ν .				26.16	y Gallilli	เฉ ษาอนามนนป			۵٥)% Perd	centile	23.92
1594				wkins W	• ,	, .				25.95						5% Perc		26.14
1595				pprox. G	• •	, ,	•			28.61						% Pero		30.67
1596				pprox. G						28.4					99	70 FEIC	-cillie	30.07
1597		<i>3</i> 0 70 F	IVV A	рргох. С	annid	UILW)E0/ 1114	VIICI	24.04
1598							9:	5% WH	USL	34.37					9	95% HV	v USL	34.24
1599											0057							
1600										Lognorma	GOF Test							

										r		
1601	A	В	C	D Shapiro Wilk T	E est Statistic	F 0.733	G	H Sha	 piro Wilk Log	l J normal GOF	K K	L
1602				Shapiro Wilk C		0.945		Data Not	Lognormal a	t 5% Signific	ance Level	
1603				Lilliefors 7	est Statistic	0.17		Li	lliefors Logno	rmal GOF To	est	
1604				5% Lilliefors C	ritical Value	0.131		Data Not	Lognormal a	t 5% Signific	ance Level	
1605					Data Not L	ognormal at	5% Significa					
1606												
1607				Bad	kground Sta	tistics assur	ning Lognorr	nal Distribut	ion			
1608			95%	UTL with 95	% Coverage	27.84				90% F	Percentile (z)	22.96
1609					95% UPL (t)	25.38				95% F	Percentile (z)	25.05
1610					95% USL	33.99				99% F	Percentile (z)	29.51
1611												
1612				No	nparametric	Distribution	Free Backgr	ound Statist	ics			
1613				[Data do not fo	ollow a Disc	ernible Distri	bution (0.05)			
1614												
1615				Nonpa	rametric Upp	er Limits for	Background	Threshold \	√alues			
1616				Order	of Statistic, r	44			95% l	JTL with 95	% Coverage	27.5
1617		Ap	prox, f used	d to compute a	chieved CC	1.158	Approxima	te Actual Co	onfidence Co	efficient achi	eved by UTL	0.665
1618							Approxir	nate Sample	Size needed	to achieve	specified CC	93
1619	9	5% Percentil	e Bootstrap	UTL with 95	% Coverage	48.86		95% BC	A Bootstrap l	JTL with 95	% Coverage	48.86
1620					95% UPL	26.45				90	% Percentile	20.18
1621				90% Che	byshev UPL	36.7				95	% Percentile	23.66
1622				95% Che	byshev UPL	45.39				99	% Percentile	42.45
1623					95% USL	54.2						
1624												
1625				tends to yield								
1626		Therefore	, one may ι	ise USL to est		-			=	data set free	of outliers	
1627					ts of observa			•				
1628				SL tends to pr								
1629		re	presents a t	oackground da	ita set and w	hen many o	nsite observa	ations need	to be compar	ed with the E	BTV.	
1630												
1631	SODIUM, L	DISSOLVED										
1632	0 1 01	- 41 - 41										
1633	General St	ausucs	Tota	al Number of C)haan (atiana	12			Numbo	of Diatinat (Observations	10
1634			1016	ii Number of C	DServations	12						10 34
1635					Minimum	13			inuitiber		Observations First Quartile	14.1
1636				900	ond Largest	20.6				·	-irst Quartile Median	16.2
1637				360	Maximum	20.9				т	hird Quartile	18.38
1638					Mean	16.45				<u> </u>	SD	2.765
1639				Coefficient	of Variation	0.168					Skewness	0.485
1640					logged Data	2.788				SD of	logged Data	0.465
1641				IVICALI UI	.oggod Dala	2.700	<u> </u>				.oggcu Data	0.100
1642				Criti	ical Values fo	r Backgrou	nd Threshold	Values (RT	Vs)			
1643			Tole	erance Factor		2.736			,	d2m	ax (for USL)	2.285
1644					. (. 5. 5)					42 11	(.0. 001)	
1645						Normal (GOF Test					
1646			:	Shapiro Wilk T	est Statistic	0.907			Shapiro Wil	k GOF Test		
1647				Shapiro Wilk C		0.859		Data ann	ear Normal a		ance Level	
1648					est Statistic	0.198		_ a.a app		GOF Test		
1649				5% Lilliefors C		0.243		Data app	ear Normal a		ance Level	
1650					ui valao	3.240		_ a.a app	- 2	Oigiiilo		

	Α	-						-						17	.	
1651	A	В	С		D		E Data appe	F ar Normal at	G : <mark>5% Significa</mark> n	H Ice Level	<u> </u>		J	K	<u>l</u> L	
1652																
1653						Bacl	kground S	tatistics Ass	uming Normal	Distributio	n					
			95%	6 UTL	with	95%	Coverage	24.02					90% F	Percentile (z	19.9	9
1654							% UPL (t)							Percentile (z		
1655							95% USL	22.77						Percentile (z		8
1656														(-,	,	
1657								Gamma	GOF Test							
1658					A-l	D Tes	st Statistic	0.45		Andei	rson-Darlir	na Ga	amma GO	F Test		
1659					5% A-[D Criti	ical Value	0.73	Detected					5% Significa	nce Leve	 el
1660					K-	S Tes	st Statistic	0.207			jorov-Smir			_		
1661							ical Value		Detected					5% Significa	nce Leve	el e
1662									stributed at 5%					o 70 Olgriiilod		
1663					Detect	ica ac	на аррсан	Gaillina Di	suibutou at 5 %	Olgriilloan	CC LCVCI					
1664								Commo	Statistics							
1665						1. 1	h = ± /N/L (T.)		Statistics			1, -4-	/b:	wa ata d MI C	20.0	
1666							hat (MLE)				Tl		•	rrected MLE		
1667					ı		hat (MLE)				ı ne		`	rrected MLE		
1668				= .			hat (MLE)						•	as corrected		
1669				MLE	vlean ((bias d	corrected)	16.45				M	ILE Sd (bia	as corrected	3.0	17
1670																
1671							-		uming Gamma	Distributio	n					
1672			on Hilferty (` ,										% Percentile		
1673		95% Hawki												% Percentile		
1674		5% WH Appr					_						99	% Percentile	24.2	:5
1675	9	5% HW Appr	ox. Gamma	a UTL	. with											
1676						95%	WH USL	23.33					9	5% HW USL	23.4	.1
1677																
1678								Lognorma	I GOF Test							
1679				Shap	iro Wil	lk Tes	st Statistic	0.92		Shap	piro Wilk L	.ogno	rmal GOF	Test		
1680			5%	Shap	iro Wil	k Criti	ical Value	0.859	I	Data appea	ar Lognorn	nal at	5% Signit	ficance Leve	I	
1681				L	_illiefor	rs Tes	st Statistic	0.196		Lil	liefors Log	gnorm	nal GOF T	est		
1682				5% L	illiefor	s Criti	ical Value	0.243	ı	Data appea	ar Lognorn	nal at	5% Signif	ficance Leve	I	
1683						Da	ita appear	Lognormal	at 5% Significa	ance Level						
1684																
1685					6	Backg	ground Sta	tistics assu	ming Lognorma	al Distributi	ion					
1686			95%	6 UTL	with	95%	Coverage	25.52					90% F	Percentile (z	20.0	7
1687						95	% UPL (t)	22.12					95% F	Percentile (z	21.3	1
1688							95% USL	23.69					99% F	Percentile (z	23.8	5
1689								I	ı						_1	
1690						Nonp	arametric	Distribution	Free Backgrou	und Statisti	cs					
1691							Data appe	ar Normal at	5% Significan	ce Level						
1692																
1693					Non	parar	netric Upp	er Limits for	Background 1	Threshold \	/alues					
						-	Statistic, r		-			% UT	L with 95	5% Coverage	20.9)
1694		At	oprox, f use	ed to c					Approximate	e Actual Co						
1695		- 1	. ,											specified CC		
1696	9	95% Percentil	e Bootstrai	o UTI	with	95%	Coverage	20.9	-FF- 47	•				5% Coverage)
1697				- 012			95% UPL							% Percentile		
1698					90% C		shev UPL							% Percentile		
1699							shev UPL							% Percentile		
1700					<i>3</i> 0% ∪	перу	SHEV UPL	29					99	/o reicentile	∠0.8	1

	Α	В			С	\perp	D		Е	F		G	Н	I			J		K		L
1701								95	% USL	20.9											
1702																					
1703																					
1704		Ther	efore,	one	may ι					-						data	set fre	e of	outliers		
1705																					
1706														_							
1707			rep	rese	nts a l	back	ground o	data se	t and w	hen many	onsit	te observa	tions need	to be co	mpare	ed w	ith the	BTV.			
1708																					
1709	SPEC. CO	OND., FIE	LD																		
1710																					
1711	General S	Statistics								40											
1712					I ota	al Nu	ımber of	Obser	vations	46											37
1713														Nι	ımber	of M	lissing				1
1714									inimum	5								First			03
1715							Se		_argest	661											30
1716								Ма	ıximum	684								Third			50
1717									Mean	336											04.6
1718							Coefficie			0.311											1.072
1719							Mean o	of logge	ed Data	5.719)						SD c	of logg	jed Data	1	0.659
1720																					
1721										_		Inresnoid	values (B l	VS)			10		<u></u>		0.004
1722					101	eran	ce Facto	or K (FC	or UTL)	2.079							۵∠۱	max (for USL,	,	2.924
1723										Nome	100	Γ Toot									
1724						Char	oiro Wilk	Toot C	Statistic	0.774		r iesi		Chani	ro \4/ill	lk GC)E Too				
1725							oiro Wilk			0.774			Data N	-					Lovel		
1726					3%		Lilliefors			0.945			Data N					ance	Levei		
1727							Lilliefors			0.279			Data N					anco	l evel		
1728						J 70 L						Significan		Ot 1401111	ai at c	J 70 O	igillio	21100			
1729																					
1730								Backor	ound S	tatistics A	ssum	ina Norma	l Distributio	on							
1731					95%	UTL	_with 9										90%	Perc	entile (z) 4	70
1732									UPL (t)	513.5									` '	′	08
1733									% USL	641.8									` '	,	79.3
1734																					
1735 1736										Gamm	na GO	F Test									
1737							A-D	Test S	Statistic	5.969)		Ande	erson-Da	arling (Gam	ma GC	OF Te	st		
1738							5% A-D	Critica	l Value	0.753	,	Da	ata Not Gar	mma Dis	stribute	ed at	5% S	ignific	ance Le	vel	
1739							K-S	Test S	Statistic	0.284			Kolmo	gorov-Sı	mirnov	v Ga	mma C	3OF	Гest		
1740						-	5% K-S	Critica	l Value	0.131		Da	ata Not Gar	mma Dis	stribute	ed at	5% Si	ignific	ance Le	vel	
1741							D	Data No	t Gamr	na Distrib	uted a	at 5% Sign	ificance Le	vel							
1742																			-		-
1743										Gamn	na Sta	atistics									
1744						-		k hat	(MLE)	5.282	!				k s	star (bias co	orrect	ed MLE)	4.952
1745						-	Th		t (MLE)	63.61				Т	heta s	•				'	67.84
1746									t (MLE)	485.9											55.6
1747						VILE !	Mean (b	ias cor	rected)	336						MLE	Sd (b	ias co	orrected) 1	51
1748												data set represents a background data set free of outliers ifrom clean unimpacted locations. Ise positives and false negatives provided the data te observations need to be compared with the BTV. Number of Distinct Observations Number of Missing Observations Number of Missing Observations Pirst Quartile Mediar Third Quartile SE Skewness SD of logged Data Skewness SD of logged Data Stevenson SD of logged Data Stevenso									·
1749											ssumi	from clean unimpacted locations. Ise positives and false negatives provided the data te observations need to be compared with the BTV. Number of Distinct Observations Number of Missing Observations First Quartile Median Median Third Quartile SD Skewness SD of logged Data Threshold Values (BTVs) Data Not Normal at 5% Significance Level Lilliefors GOF Test Data Not Normal at 5% Significance Level Sign									
1750		95%	Wilso	n Hil	ferty ((WH)	Approx.	. Gamn	na UPL	604							9	0% P	ercentile	5	38.1

	Α	В		С		D	Е	F	G	Н		ı	Τ.		K	L
1751		95% Hav	wkins \	Nixley (H	HW) Aı	oprox.	Gamma UP	643.7						95	% Percentile	616.5
1752		95% WH Ap	oprox.	Gamma	UTL w	vith 95	5% Coverag	e 685						99	% Percentile	782.3
1753		95% HW Ap	oprox.	Gamma	UTL w	vith 95	5% Coverag	e 742.8								
						9	5% WH US	889.3						9	5% HW USL	1002
1754																
1755								Loanorm	al GOF Test							
1756					Shapir	n Wilk	Test Statisti	-	1	Sha	niro W	ilk Loa	normal	GOF	Test	
1757					•		Critical Value				=	_			ance Level	
1758				070 0			Test Statisti						ormal G			
1759							Critical Value					-			cance Level	
1760				`	0 70 Em	101010			nt 5% Significa		Logilo	illiai a	70 0	9111110		
1761							Data 140t	Logiloillaic	it 0 /0 Olgriillot	INCC ECVCI						
1762						Bo.	ckground St	atietice aceu	ıming Lognori	nal Dietribu	tion					
1763				OE0/	LITL		% Coverag		Tilling Logiton	ilai Distribu	uOH			200/ F	Percentile (z)	708.9
1764				95 /0	OILW		95% UPL (1								Percentile (z)	900.7
1765															` '	
1766							95% US	2092					,	າສ% F 	Percentile (z)	1411
1767								Dietalle - 41	Enes Da-l-	aumal Ox-xt	Nos					
1768							•		Free Backgr							
1769							Data do not	tollow a Disc	cernible Distri	bution (U.Ut)) 					
1770									_	-						
1771							•	•	or Background	Threshold	Values					
1772							of Statistic,								5% Coverage	
1773			Appro	x, t used	d to co	mpute	achieved Co	1.184							eved by UTL	
1774									Approxir	•					specified CC	
1775		95% Percei	ntile Bo	ootstrap	UTL w	vith 95	•			95% BC	CA Boot	tstrap	UTL wit		5% Coverage	
1776							95% UP							90	% Percentile	376
1777							ebyshev UP								% Percentile	
1778					95	5% Che	ebyshev UP							99	% Percentile	673.7
1779							95% US	684								
1780																
1781									e of BTV, esp						•	
1782		Therefo	ore, on	ne may u	ıse US	L to es	timate a BT	only when	the data set r	epresents a	backg	round	data se	t free	of outliers	
1783					and	consi	sts of observ	ations colle	cted from clea	n unimpact	ed loca	tions.				
1784			The u	use of US	SL ten	ds to p	rovide a bala	ance betwee	n false positiv	es and fals	e negat	tives p	rovided	the d	lata	
1785			repres	sents a b	oackgro	ound d	ata set and	when many	onsite observa	ations need	to be c	ompar	ed with	the E	BTV.	
1786																
	SPEC. C	OND., LAB														
1788																
	General	Statistics														
1790				Tota	al Num	ber of (Observation	s 46			N	lumbe	r of Dis	tinct (Observations	38
1791											N	lumbe	r of Mis	sing (Observations	1
1792							Minimun	n 242						F	First Quartile	273.3
1793						Sec	cond Larges	t 790							Median	302
1794							Maximun	n 1020						T	hird Quartile	337.5
1795							Mea	n 345.1							SD	145.8
1796					Coe	efficien	t of Variatio	0.422							Skewness	3.239
1797					N	lean of	logged Dat	a 5.79					;	SD of	logged Data	0.295
1797								1								1
						Crit	tical Values	for Backgrou	und Threshold	Values (B	ΓVs)					
1799				Tole	erance		K (For UTL				•			d2m	nax (for USL)	2.924
1800				7010		. 40101		, 2.373								2.02

	A B C D E	F	G H I J K	L
1801				
1802			GOF Test	
1803	Shapiro Wilk Test Statistic	0.587	Shapiro Wilk GOF Test	
1804	5% Shapiro Wilk Critical Value	0.945	Data Not Normal at 5% Significance Level	
1805	Lilliefors Test Statistic	0.288	Lilliefors GOF Test	
1806	5% Lilliefors Critical Value	0.129	Data Not Normal at 5% Significance Level	
1807	Data Not	Normal at 5	% Significance Level	
1808				
1809		atistics Ass	uming Normal Distribution	
1810	95% UTL with 95% Coverage	648.2	90% Percentile (z)	531.9
1811	95% UPL (t)	592.5	95% Percentile (z)	584.9
1812	95% USL	771.3	99% Percentile (z)	684.2
1813				
1814		Gamma	GOF Test	
1815	A-D Test Statistic	4.86	Anderson-Darling Gamma GOF Test	
1816	5% A-D Critical Value	0.749	Data Not Gamma Distributed at 5% Significance Lev	el
1817	K-S Test Statistic	0.243	Kolmogorov-Smirnov Gamma GOF Test	
1818	5% K-S Critical Value	0.13	Data Not Gamma Distributed at 5% Significance Lev	el
1819	Data Not Gamm	na Distribute	d at 5% Significance Level	
1820				
1821		Gamma	Statistics	
1822	k hat (MLE)	9.494	k star (bias corrected MLE)	8.889
1823	Theta hat (MLE)	36.35	Theta star (bias corrected MLE)	38.82
1824	nu hat (MLE)	873.4	nu star (bias corrected)	817.8
1825	MLE Mean (bias corrected)	345.1	MLE Sd (bias corrected)	115.7
1826				
1827	Background Sta	atistics Assu	uming Gamma Distribution	
1828	95% Wilson Hilferty (WH) Approx. Gamma UPL	555.8	90% Percentile	499.2
1829	95% Hawkins Wixley (HW) Approx. Gamma UPL	551.7	95% Percentile	554.8
1830	95% WH Approx. Gamma UTL with 95% Coverage	617.1	99% Percentile	669.6
1831	95% HW Approx. Gamma UTL with 95% Coverage	613.7		
1832	95% WH USL	768.3	95% HW USL	769.4
1833			1	
1834		Lognorma	GOF Test	
1835	Shapiro Wilk Test Statistic	0.738	Shapiro Wilk Lognormal GOF Test	
1836	5% Shapiro Wilk Critical Value	0.945	Data Not Lognormal at 5% Significance Level	
1837	Lilliefors Test Statistic	0.217	Lilliefors Lognormal GOF Test	
1838	5% Lilliefors Critical Value	0.129	Data Not Lognormal at 5% Significance Level	
1839	Data Not Lo	ognormal at	5% Significance Level	
1840				
1841	Background Stat	tistics assur	ning Lognormal Distribution	
1842	95% UTL with 95% Coverage	604.6	90% Percentile (z)	477.6
1843	95% UPL (t)	540.1	95% Percentile (z)	531.7
1844	95% USL	776	99% Percentile (z)	650.3
1845				
1846	Nonparametric I	Distribution	Free Background Statistics	
1847	Data do not fo	ollow a Disce	ernible Distribution (0.05)	
1848				
10401				
1849	Nonparametric Uppe	er Limits for	Background Threshold Values	

	Α	В	С	D	Е	F	G	Н	I	J	К	L
1851		A	Approx, f used	to compute	achieved CC	1.184	Approxima	te Actual Co	nfidence Co	efficient achieved	d by UTL	0.677
1852							Approxin	nate Sample	Size neede	d to achieve spec	cified CC	93
1853	g	5% Percent	tile Bootstrap	JTL with 9	5% Coverage	962.5		95% BCA	A Bootstrap (JTL with 95% C	Coverage	912.3
1854					95% UPL	743.1				90% P	ercentile	425
1855				90% Ch	ebyshev UPL	787.1				95% P	ercentile	639.3
1856				95% Ch	ebyshev UPL	987.4				99% P	ercentile	916.5
1857					95% USL	1020						
1858												
1859							•			size starts excee	•	
1860		Therefor	e, one may us							data set free of	outliers	
1861					ists of observa			•				
1862										rovided the data		
1863		r	epresents a ba	ackground (data set and w	hen many or	nsite observa	ations need to	o be compar	ed with the BTV.		
1864	0111 54 75											
1865	SULFATE											
1866	Conord Ct	atiatiaa										
1867	General St	ausucs	Total	Number of	Observations	45			Numba	r of Distinct Obse	nuctions	40
1868			Total	Number of	Observations	45				of Missing Obse		2
1869					Minimum	6.9			Number		Quartile	9.8
1870				94	econd Largest	74				FIISI	Median	12.3
1871					Maximum	188				Third	Quartile	23.3
1872					Mean	23.37				Tilliu	SD	29.46
1873				Coefficie	nt of Variation	1.26				SI	kewness	4.309
1874					of logged Data	2.807				SD of logg		0.728
1875				- Indan c	n logged Data	2.007					jou Data	0.720
1876				Cr	itical Values fo	or Backgrour	nd Threshold	Values (BT\	/s)			
1877			Tole		or K (For UTL)	•				d2max (for USL)	2.915
1878 1879											,	
1880						Normal C	GOF Test					
1881			S	hapiro Wilk	Test Statistic	0.534			Shapiro Wi	k GOF Test		
1882			5% S	hapiro Wilk	Critical Value	0.945		Data No	t Normal at	5% Significance	Level	
1883				Lilliefors	Test Statistic	0.288			Lilliefors	GOF Test		
1884			5	% Lilliefors	Critical Value	0.131		Data No	t Normal at	5% Significance	Level	
1885					Data Not	Normal at 5	% Significan	ce Level				
1886												
1887					Background S	tatistics Ass	uming Norma	al Distributior	1			
1888			95% l	JTL with 9	5% Coverage	84.79				90% Perc	entile (z)	61.12
1889					95% UPL (t)	73.41				95% Perc	` '	71.82
1890					95% USL	109.2				99% Perc	entile (z)	91.9
1891												
1892							GOF Test					
1893					Test Statistic	3.024				Gamma GOF Te		
1894					Critical Value	0.766	D			ed at 5% Signific		rel
1895					Test Statistic	0.239				v Gamma GOF 1		
1896					Critical Value	0.134				ed at 5% Signific	cance Lev	rel
1897					ata Not Gamn	na Distribute	at 5% Sigr	nificance Lev	e l			
1898						0	Osasiasia					
1899					k bet /B41 E\		Statistics		1	ntor/hi== :	od MI E	1 505
1900					k hat (MLE)	1.597			K :	star (bias correct	ea MLE)	1.505

	A	В	С	T D	ΙE	F	G	Н	1	J	K	1
1901	<u> </u>			_	eta hat (MLE)		u		Theta	star (bias cor		15.53
1902					nu hat (MLE)	143.7				nu star (bia	s corrected)	135.5
1903			M	ILE Mean (bi	as corrected)	23.37				MLE Sd (bia	s corrected)	19.05
1904							l					
1905				В	ackground S	tatistics Assu	ıming Gamm	na Distributio	n			
1906			• `	,	Gamma UPL	59.58				90	% Percentile	48.66
1907		95% Hawki	ns Wixley (F	HW) Approx.	Gamma UPL	58.64				95	% Percentile	60.81
1908	9:	5% WH Appr	ox. Gamma	UTL with 9	5% Coverage	73.86				999	% Percentile	88.23
1909	9:	5% HW Appr	ox. Gamma	UTL with 9	5% Coverage	73.67						
1910				9	95% WH USL	111.9				9	5% HW USL	115.6
1911												
1912							GOF Test					
1913				•	Test Statistic			-	-	_		
1914			5% S		Critical Value	0.945						
1915					Test Statistic				-			
1916			Ę	5% Lilliefors	Critical Value				Lognormal a	at 5% Signific	ance Level	
1917					Data Not L	ognormal at	5% Significa	nce Level				
1918												
1919					_		ning Lognorr	nal Distributi	on			
1920			95%	UTL with 9	5% Coverage						` '	42.09
1921					95% UPL (t)						` ,	54.84
1922					95% USL	138.3				99% F	ercentile (z)	90.06
1923												
1924					•				CS			
1925					Data do not f	ollow a Disce	ernible Distri	bution (0.05)				
1926				Name		an Linelto for	Da alama un d	Thurshald \	/aluan			
1927	1			-	of Statistic, r		background	Threshold v		LITI with 05	% Coverage	74
1928		۸۰	nrov fuond		achieved CC		Approvima	to Astual Co			ŭ	0.665
1929		\\	oprox, ruseo	i to compute	acriieveu CC	1.100					-	93
1930		5% Percentil	e Bootetran	LITI with Q	5% Coverage	165.2	Арріоліі	·			•	160.7
1931		O 70 T CICCITAI	С Бооізпар	OTE WILL 5	95% UPL			3370 DO	ТВооізпар			45.2
1932				90% Ch	ebyshev UPL							58.66
1933					ebyshev UPL							137.8
1934					95% USL						70 1 0100111110	
1935					30,000							
1936		Note: The	use of USI	tends to viel	d a conservat	ive estimate	of BTV. esne	ecially when	the sample	size starts ex	ceedina 20	
1937							<u> </u>	<u> </u>	<u> </u>			
1938			· · · · · · · · · ·			•			_			
1939		T	he use of US					<u> </u>		provided the d	ata	
1940												
1941 1942			-			, -						
10/12	ALKALINIT	Υ										
1943												
1944						General	Statistics					
1945			Tota	l Number of	Observations	46			Numbe	er of Missing C	Observations	1
1946			Numbe	er of Distinct	Observations	14						
1947				Numb	er of Detects	20				Number of	Non-Detects	26
1949			N	lumber of Dis	stinct Detects	14	95% Perion 99% Perion 99% Perion 95% HV Shapiro Wilk Lognormal GOF Test Data Not Lognormal at 5% Significance L Lilliefors Lognormal GOF Test Data Not Lognormal at 5% Significance L at 5% Significance Level uming Lognormal Distribution 90% Percen 95% Percen 99% Percen 99% Percen 99% Percen 99% Percen 99% Percen 95% UTL with 95% Cov Approximate Actual Confidence Coefficient achieved L Approximate Sample Size needed to achieve specifi 95% BCA Bootstrap UTL with 95% Cov 90% Percen 95% Percen 95% Percen 95% Percen 95% BCA Bootstrap UTL with 95% Cov approximate Sample Size needed to achieve specificant achieved L 95% BCA Bootstrap UTL with 95% Cov 90% Percen 95% Pe					1
1950				Mir	nimum Detect	5	90% Perc 95% Perc 95% Perc 95% HW 1 GOF Test Shapiro Wilk Lognormal GOF Test Data Not Lognormal at 5% Significance Lognormal GOF Test Data Not Lognormal at 5% Significance Lognormal at 5% Significance Lognormal at 5% Significance Lognormal at 5% Significance Lognormal Distribution 90% Percent 95% Percent 95% Percent 99% Percent 99% Percent 95% UTL with 95% Cov Approximate Actual Confidence Coefficient achieved by Approximate Sample Size needed to achieve specific 95% BCA Bootstrap UTL with 95% Cov 90% Percent 95%					5
1900												

			т -	_	_			-	· ^				-	-	1	1/ 1	
1951	Α	В		С	D		E um Detect	F 182	G	H		ı		J Maximur	n Non	K -Detect	L 5
1951					V	'ariance	Detected	3029						Percent	: Non-[Detects	56.52%
1953						Mear	n Detected	42.2							SD De	etected	55.03
1953				Mean	of Dete	cted Lo	gged Data	2.904				5	SD of	Detected	Logge	ed Data	1.329
1954																	
1956						Critica	al Values f	or Backgrou	nd Threshol	d Values (BTV	s)					
1957				Tole	rance F	actor K	(For UTL)	2.079	Shapiro Wilk GOF Test Data Not Normal at 5% Significance Le Lilliefors GOF Test Data Not Normal at 5% Significance Le Significance Level Sistics Assuming Normal Distribution Page 18							or USL)	2.924
1958																	
1959							Norn	nal GOF Tes	t on Detects	s Only							
1960				S	Shapiro \	Wilk Te	st Statistic	0.725				Shapiro	Wilk (GOF Test	t		
1961				5% S	hapiro V	Vilk Crit	tical Value	0.905		Data	Not	Normal	at 5%	Significa	nce Le	evel	
1962					Lillie	fors Te	st Statistic	0.283				Lilliefo	rs GC	OF Test			
1963				5	% Lilliet	fors Crit	tical Value	0.192		Data	Not	Normal	at 5%	Significa	nce Le	evel	
1964							Data No	Normal at	5% Significa	nce Level							
1965																	
1966					Kaplar	n Meier	(KM) Bac	kground Stat	istics Assun	ning Norm	al Di	stributio	n				
1967							KM Mean	21.17								KM SD	39.89
1968					95% U	TL95%	Coverage	104.1						95	% KM	UPL (t)	88.89
1969					90%	KM Per	rcentile (z)	72.29						95% KM	Percei	ntile (z)	86.78
1970					99%	KM Per	rcentile (z)	114							95% K	M USL	137.8
1971																	
1972					DL/2	Substitu	ution Back	ground Stati	stics Assum	ing Norma	l Dis	tribution					
1973							Mean	19.76								SD	40.92
1974					95% U	TL95%	Coverage	104.9							95%	UPL (t)	89.23
1975					9	0% Per	rcentile (z)	72.21						95%	Perce	ntile (z)	87.07
1976					9	9% Per	rcentile (z)	115							95	% USL	139.4
1977				DL/2 is r	not a rec	commer	nded meth	od. DL/2 pro	vided for co	mparisons	and	historic	al rea	sons		,	
1978																	
1979						Gai	mma GOF	Tests on De	etected Obs	ervations (Only						
1980						A-D Te	st Statistic	1.479			An	derson-l	Darlin	g GOF To	est		
1981							tical Value		[Data Not G					•	nce Lev	el
1982						K-S Te	st Statistic	0.263			K	olmogoro	ov-Sn	nirnov GC	F		
1983					5% l		tical Value						buted	at 5% Si	gnifica	nce Lev	el
1984						Data	Not Gam	ma Distribut	ed at 5% Sig	gnificance l	Leve	1					
1985																	
1986								Statistics or	Detected D	Data Only							
1987							hat (MLE)							`		,	0.644
1988							hat (MLE)					The					65.56
1989							hat (MLE)						r	nu star (bi	as cor	rected)	25.75
1990				М		•	corrected)										
1991					MLE S	d (bias	corrected)	52.6			ç	95% Per	centil	e of Chiso	quare ((2kstar)	4.516
1992																	
1993																	
1994																	
1995		GROS m	ay not							•					(e.g., <	<15-20)	
1996				Fo	or such s			-	-				BTV	S			
1997																	
1998		For ga	amma	distribu	ted dete	ected da			ay be comp	uted using	gan	ıma distı	ributio	n on KM	estima		
1999							Minimum									Mean	18.35
2000							Maximum	182		Shapiro Wilk GOF Test Data Not Normal at 5% Significance Level Lilliefors GOF Test Data Not Normal at 5% Significance Level ance Level Iming Normal Distribution KM 95% KM UPL 95% KM Percentile 95% KM UPL 95% Percentile 95% Percentile 95% UPL 95% Percentile of Chisquare 10 In ustar (bias corrected Minustar							0.01

	_	_	_													_		
2001	Α	В	С		D		E SD	F 41.54	G		Н		ı		J		K CV	2.264
2001						k ha	t (MLE)	0.177						k star	(bias co	orrecte	ed MLE)	0.179
2002					The		t (MLE)	104					The	ta star	(bias co	orrecte	ed MLE)	102.3
2003						nu ha	t (MLE)	16.24						nı	ı star (b	ias co	orrected)	16.51
2004			N	/ILE N	lean (bi	as coi	rected)	18.35						ML	E Sd (b	ias co	orrected)	43.32
			95% Perce		•		,	1.9							`		ercentile	55.34
2006							rcentile	97.16							99	9% Pe	ercentile	214.4
2007			The	follov				puted using	Gamma	ROS S	Statistic	s on	Impute	d Data				
2008					•			Hilferty (WF					•					
2010							٧H	HW	•		-					١	WH	HW
2010	95% Appi	rox. Gamma	UTL with 9	5% C	overage	e 10	7.1	123.6				95%	Appro	x. Gan	nma UP	L 7	70.53	73.64
	• • • • • • • • • • • • • • • • • • • •				ma USL		8.9	320.5										
2012																		
2013					E	stimat	es of Ga	amma Parar	neters us	ng KM	l Estim	ates						
2014							an (KM)	21.17									SD (KM)	39.89
2015					V		ce (KM)	1591							SE	of Me	ean (KM)	6.034
						k h	at (KM)	0.282								k s	tar (KM)	0.278
2017							at (KM)	25.92								nu s	tar (KM)	25.57
2018					tŀ		at (KM)	75.14							th	neta s	tar (KM)	76.19
2019			80	% gai	mma pe		` ′	31.81					ç	90% ga	ımma p	ercent	tile (KM)	62.98
2020					mma pe			99.23									tile (KM)	194.4
2021					<u>'</u>		` '								<u> </u>		, ,	
2022			The	e folic	wina st	atistic	s are co	mputed usir	a aamma	distril	oution a	and K	M estir	nates				
2023								Hilferty (Wh										
2024							VH	HW				(,				١	WH	HW
2025	95% Appi	rox. Gamma	UTL with 9	5% C	overage	e 8	7.89	85.95				95%	Appro	x. Gan	ıma UP	L 6	65.89	62.81
2026	• • • • • • • • • • • • • • • • • • • •		% KM Gamı				3.18	60.03							nma US		52.9	159.3
2027																		
2029					L	ognor	mal GO	F Test on D	etected O	bserva	ations C	Only						
2030			(Shapi	ro Wilk	Test S	Statistic	0.844				S	hapiro	Wilk G	OF Tes	t		
2031			5% 5	Shapii	ro Wilk (Critica	ıl Value	0.905		ı	Data No	ot Lo	gnorma	al at 5%	6 Signifi	cance	e Level	
2032				L	illiefors	Test S	Statistic	0.225					Lilliefo	rs GO	F Test			
2032			Į.	5% Li	lliefors (Critica	ıl Value	0.192		I	Data No	ot Lo	gnorma	al at 5%	6 Signifi	cance	e Level	
2034						Da	ta Not L	ognormal at	5% Signi	ficance	e Level							
2035																		
2036		В	ackground	Logno	ormal R	OS SI	tatistics .	Assuming L	ognormal	Distrib	oution (Jsing	Impute	ed Non	-Detect	S		
2037				М	ean in C	Origina	al Scale	18.78							Mear	n in Lo	og Scale	0.695
2038					SD in C	Origina	al Scale	41.36							SE) in Lo	og Scale	2.401
2039				95%	6 UTL95	5% Co	verage	295					9	5% BC	A UTL9	5% C	overage	164.8
2040		9	5% Bootstra	ар (%) UTL95	5% Co	verage	175								95%	GUPL (t)	118
2041					90% I	Perce	ntile (z)	43.46							95%	Perce	entile (z)	104
2042					99% I	Perce	ntile (z)	533.8								9	5% USL	2242
2043									<u> </u>									
2044			Stati	istics	using K	M est	imates c	n Logged D	ata and A	ssumi	ng Log	norm	al Disti	ibutior	1			
2045				KM N	/lean of	Logge	ed Data	2.172			9	5% K	M UTL	. (Logn	ormal)9	5% C	Coverage	80.91
2045					/I SD of			1.068						95%	KM UP	L (Log	gnormal)	53.81
2047			95% KM	/I Per	centile L	ogno	rmal (z)	50.87						95%	KM US	L (Log	gnormal)	199.5
2047							- 1		<u> </u>									
2049					Back	groun	d DL/2 S	Statistics Ass	suming Lo	gnorm	nal Dist	ributi	on					
				M	ean in C			19.76		-					Mear	n in Lo	og Scale	1.78
2050								-									J	

	Α	В	С	D	E	F	G	Н	I 1	J K	Т і
2051			0	_	Original Scale	40.92	u		<u>'</u>	SD in Log Sca	e 1.318
2052				95% UTL	95% Coverage	91.98				95% UPL (t) 55.6
2053				90%	Percentile (z)	32.13				95% Percentile (2) 51.87
2054				99%	Percentile (z)	127.4				95% US	L 280.1
2055			DL/2 is	not a Recon	nmended Metho	od. DL/2 pro	vided for cor	nparisons ar	nd historical	reasons.	
2056											
2057				ı	Nonparametric	Distribution	Free Backgr	ound Statisti	cs		
2058					Data do not fo	ollow a Disc	ernible Distri	bution (0.05)	ı		
2059											-
2060			Nonpar	ametric Upp	er Limits for BT	Vs(no distin	ction made l	oetween dete	ects and no	ndetects)	
2061				Orde	er of Statistic, r	45			95	% UTL with95% Coverag	e 154
2062		А	pprox, f use	d to comput	e achieved CC	1.184	Approxima	ite Actual Co	nfidence C	oefficient achieved by UT	L 0.677
2063	Approxin	nate Sample	e Size need	ed to achiev	e specified CC	93				95% UP	L 139.7
2064					95% USL	182				95% KM Chebyshev UP	L 196.9
2065											
2066		Note: The	e use of USI	tends to yie	eld a conservati	ive estimate	of BTV, esp	ecially when	the sample	size starts exceeding 20	
2067		Therefore	e, one may						_	d data set free of outliers	
2068					sists of observa						
2069										provided the data	
2070		re	epresents a	background	data set and w	hen many o	nsite observa	ations need t	o be compa	ared with the BTV.	
2071											
2072	TDS (TOTA	L DISSOLV	ED SOLIDS	5)							
2073											
2074	General Sta	itistics									
2075			Tot	al Number o	f Observations	46				er of Distinct Observation	
2076									Numbe	er of Missing Observation	
2077					Minimum	135				First Quartil	
2078				S	econd Largest	447				Media	
2079					Maximum	619				Third Quarti	
2080				0 (Mean					S	
2081					ent of Variation	0.346				Skewnes	
2082				Mean	of logged Data	5.466				SD of logged Da	a 0.29
2083											
2084			-		ritical Values fo		nd Threshold	Values (BT	Vs)	10 (6 110)	V 0.004
2085			IO	erance Fact	or K (For UTL)	2.079				d2max (for USI	2.924
2086						Normal	GOF Test				
2087				Shanira Wil	k Test Statistic	0.795	JOF TEST		Chanina 14	/ilk GOF Test	
2088				•	Critical Value	0.795		Data Na	•	5% Significance Level	
2089			5%		s Test Statistic	0.945		Data NC		GOF Test	
2090					Critical Value	0.195		Data No		5% Significance Level	
2091				J /0 LIIIIEIUIS			i% Significan		, indilial al	. 5 /0 Giginicance Level	
2092					וייים ואטנ	raomiai at 0	70 Gigiiillean	IOG LEVEI			
2093					Background S	tatistice Acc	umina Norm	al Distributio	n		
2094			95%	UTI with	95% Coverage			<i>-</i> .30113440	••	90% Percentile (2	2) 356.9
2095			9570	, O I & VVIUI	95% Coverage 95% UPL (t)	392.5				95% Percentile (2	<i>'</i>
2096					95% USL	497.3				99% Percentile (2	,
2097						.07.0]			23 /0 1 Groomine (/	7 170.2
2098						Gamma	GOF Test				
2099				Δ_Γ) Test Statistic	1.421		Andei	son-Darling	g Gamma GOF Test	
2100				/\-L		1.741		, 111461	Parmit	,	

	Α	В	С	D	Е	F	G	Н	1	J	K	L
2101		•	•	5% A-D (Critical Value	0.749		Data Not Ga	amma Distribu	ited at 5% Sig	nificance Lev	/el
2102				K-S	Test Statistic	0.147		Kolmo	ogorov-Smirn	ov Gamma Go	OF Test	
2103				5% K-S (Critical Value	0.13		Data Not Ga	amma Distribu	ited at 5% Sig	nificance Lev	/el
2104				Da	ata Not Gamr	na Distribute	ed at 5% S	ignificance L	evel			
2105												
2106						Gamma	Statistics					
2107					k hat (MLE)	11.23			k	star (bias cor	rected MLE)	10.51
2108				The	eta hat (MLE)	22.03			Theta	star (bias cor	rected MLE)	23.53
2109					nu hat (MLE)	1033				nu star (bia	s corrected)	967
2110			N	MLE Mean (bia	as corrected)	247.3				MLE Sd (bia	s corrected)	76.29
2111												
2112				В	ackground St	atistics Assu	ıming Gan	nma Distribu	tion			
2113		95% Wilso	on Hilferty (WH) Approx.	Gamma UPL	386.2				909	% Percentile	348.8
2114		95% Hawki	ins Wixley (HW) Approx.	Gamma UPL	386.1				959	% Percentile	384.7
2115	9!	5% WH Appr	ox. Gamma	UTL with 95	5% Coverage	425.8				999	% Percentile	458.4
2116	9!	5% HW Appr	ox. Gamma	UTL with 95	5% Coverage	426.8						
2117				9	5% WH USL	522.7				9	5% HW USL	528.5
2118												
2119						Lognorma	GOF Tes	t				
2120				Shapiro Wilk	Test Statistic	0.934		Sh	apiro Wilk Lo	gnormal GOF	Test	
2121			5% :	Shapiro Wilk (Critical Value	0.945		Data No	ot Lognormal	at 5% Signific	ance Level	
2122				Lilliefors	Test Statistic	0.125		I	Lilliefors Logn	ormal GOF To	est	
2123				5% Lilliefors (Critical Value	0.129		Data app	ear Lognorma	al at 5% Signif	icance Level	
2124				Data a	appear Appro	ximate Logn	ormal at 5	% Significan	ce Level			
2125												
2126					ckground Sta		ning Logno	ormal Distrib	ution			
2127			95%	UTL with 95							Percentile (z)	342.7
2128					95% UPL (t)	386.6					Percentile (z)	380.7
2129					95% USL	551.5				99% F	Percentile (z)	463.8
2130												
2131					onparametric			<u> </u>				
2132				Data a	appear Appro	ximate Logn	ormal at 5	% Significan	ce Level			
2133												
2134				•	rametric Upp		Backgrou	nd Threshold				
2135					of Statistic, r	45				UTL with 95	•	
2136		Ap	oprox, f use	d to compute	achieved CC	1.184				pefficient achie	•	0.677
2137							Appro	•		ed to achieve s	·	93
2138	9	5% Percentil	e Bootstrap	UTL with 95	_	576		95% B	CA Bootstrap	UTL with 95	•	572.5
2139					95% UPL	442.1					% Percentile	320.5
2140					ebyshev UPL	506.6					% Percentile	420
2141				95% Che	ebyshev UPL	624				999	% Percentile	541.6
2142					95% USL	619						
2143												
2144				•					•	size starts ex		
2145		Therefore	e, one may ı							I data set free	of outliers	
2146									ted locations.			
2147										orovided the d		
2148		re	presents a l	background d	ata set and w	hen many o	nsite obse	rvations need	d to be compa	red with the B	STV.	
2149												
2150	TOC (TOT	AL ORGANIC	C CARBON)								

	Α	В	С	\top	D	\top	E	l F	G	Н	Т		J		K	
2151	- ' '	 							<u> </u>		<u> </u>				- 1	
2152								Genera	Statistics							
2153			Tot	tal Nı	ımber of	Obs	servations	46			Numl	ber o	f Missing	Obse	ervations	1
			Numb	er of	Distinct	Obs	servations	16								
2154					Num	her (of Detects	15				N	Number o	of Non	-Detects	31
2155				Num			ct Detects				Num		of Distinc			
2156				- Tuill			um Detect				- Tun				n-Detect	
2157							um Detect								n-Detect	
2158							Detected								-Detects	
2159							Detected						reiceii		Detected	0.494
2160			Maa				gged Data)D -4	Datastas			
2161			iviea	11 01 1	Jeleciel	1 LOG	Jged Data	-0.076				וט טו	Detected	ı Logç	jeu Data	0.416
2162							137-14	DI	d Th ab al	4)/alaaa (DT	3.(-)					
2163								_	ina i nresnoi	d Values (BT	vs)			. ,		0.004
2164			10	leran	ce Facto	or K	(For UTL)	2.079					d2	max (for USL)	2.924
2165																
2166									st on Detects	s Only						
2167							st Statistic				Shapiro \					
2168			5%	-			ical Value			Data N	ot Normal a		•	ance l	Level	
2169					Lilliefors	Tes	st Statistic						OF Test			
2170							ical Value			Detected Data		lorma	al at 5% S	Signific	cance Le	vel
2171					Detected	d Da	ta appear	· Approxima	te Normal at	5% Significa	nce Level					
2172																
2173				K	aplan Me	eier ((KM) Bac	kground Sta	tistics Assur	ning Normal	Distributior	n				
2174							KM Mean	0.734							KM SD	0.35
2175				95	% UTLS)5%	Coverage	1.463					95	% KN	I UPL (t)	1.329
2176					90% KM	Per	centile (z)	1.183					95% KM	Perce	entile (z)	1.311
2177					99% KM	Per	centile (z)	1.549						95%	KM USL	1.759
2178																
2179				C	L/2 Sub	stitu	ition Back	ground Stat	istics Assum	ing Normal D	istribution					
2180							Mean	0.634							SD	0.391
2181				95	% UTLS)5%	Coverage	1.448						95%	6 UPL (t)	1.298
2182					90%	Per	centile (z)	1.136					95%	Perce	entile (z)	1.278
2183					99%	Per	centile (z)	1.544						9	5% USL	1.778
2184			DL/2 is	s not	a recom	men	ided meth	od. DL/2 pr	ovided for co	mparisons a	nd historica	al rea	asons			
2185																
2186						Gar	nma GOF	Tests on D	etected Obs	ervations On	ly					
2187					A-D	Tes	st Statistic	0.469		-	Anderson-E	Darlir	ng GOF T	est		
2188					5% A-D	Crit	ical Value		Detect	ed data appe					Significar	nce Level
					K-S	Tes	st Statistic	0.174			Kolmogoro	ov-Sr	nirnov G0	OF		
2189							ical Value		Detect	ed data appe					Significar	nce Level
2190										5% Significar					5 .23.	
2191										- 35 3.8.3.11001						
2192							Gamma	Statistics o	n Detected [)ata Only						
2193						 	hat (MLE)		Dolocieu L	Jam Olly		k etr	ar (bias co	orrect	ed MI E/	4.656
2194					т,		hat (MLE)				Tho		ar (bias co		,	
2195							,				ine		•			139.7
2196				VVI L	Maar /		hat (MLE)						nu star (b	nas CC	mecied)	133.7
2197					•		corrected)				050/ 5		f O' '		(Ol2)	47.05
2198				IVI	_⊏ Sd (b	nas c	corrected)	0.469			95% Pero	centil	e of Chis	quare	e (∠ĸstar)	17.35
2199																
2200						Gar	nma ROS	Statistics u	sing Impute	d Non-Detect	'S					

	Α	В	С	D	E	F	G	Н	I	J	K	L
2201		CD00	<u> </u>							multiple DLs		
2202		GRUS ma	y not be used				yield incorre			•	e.g., < 15-20)	
2203			FUI			•	n the sample			1 V S		
2204		Forgo	mma distribute				<u> </u>			ition on KM o	etimatos	
2205		i oi gai	Tima distribute	eu delecteu (Minimum		by be compar	led using gai	illia distribi	ILION ON KIVI E	Mean	0.601
2206					Maximum	2.4					Median	0.586
2207					SD	0.479					CV	0.797
2208					k hat (MLE)	1.01			k	star (bias cori		0.958
2209					ta hat (MLE)	0.595				star (bias cori	,	0.627
2210					u hat (MLE)	92.9				•	s corrected)	88.17
2211			ML	.E Mean (bia		0.601				MLE Sd (bia	,	0.614
2212			95% Percent	,	·	5.829				•	% Percentile	1.398
2213 2214				95%	% Percentile	1.828				99%	Percentile	2.828
2215			The fo	ollowing statis	stics are con	nputed using	Gamma RO	S Statistics	on Imputed I	Data		
2216			U	pper Limits ι	ısing Wilson	Hilferty (WH) and Hawkii	ns Wixley (H	W) Methods	i		
2217					WH	HW					WH	HW
2218	95% App	rox. Gamma	UTL with 959	% Coverage	2.349	2.718		95	5% Approx.	Gamma UPL	1.841	2.047
2219			95% G	amma USL	3.789	4.774						
2220												
2221				Es	timates of G	amma Parar	neters using	KM Estimate	es			
2222					Mean (KM)	0.734					SD (KM)	0.35
2223				Va	riance (KM)	0.123				SE of	Mean (KM)	0.0588
2224					k hat (KM)	4.396					k star (KM)	4.124
2225					nu hat (KM)	404.5				r	nu star (KM)	379.4
2226				the	eta hat (KM)	0.167					ta star (KM)	0.178
2227				gamma per		1.009				% gamma per		1.219
2228			95%	gamma per	centile (KM)	1.412			999	% gamma per	centile (KM)	1.824
2229												
2230						•	g gamma dis					
2231			U	pper Limits ι) and Hawkii	ns Wixley (H	W) Methods	i	1001	1.044
2232	050/ 4			2/ 0	WH	HW			-0/ 4	0 1101	WH	HW
2233	95% App		WITL with 959		1.423	1.422		95		Gamma UPL Gamma USL	1.263	1.257
2234		95	% KW Gamini	a Percentile	1.242	1.236			95%	Gamma USL	1.823	1.841
2235				1.0	anormal GO	F Teet on De	etected Obse	rvatione ∩nl	v			
2236			912	napiro Wilk T	~	0.944	Judied Obse	, 7000113 OIII		lk GOF Test		
2237				napiro Wilk C		0.881	Dete	ected Data a		ormal at 5% S	ignificance I	.evel
2238			2 /0 311	•	est Statistic	0.147	2010			GOF Test	J00.100 L	- : = :
2239			5%	% Lilliefors C		0.22	Dete	ected Data a		ormal at 5% S	ignificance L	.evel
2240							mal at 5% Si				J00.100 L	- : = :
2241						,	2 5.0					
2242		E	Background Lo	ognormal RC	S Statistics	Assuming Lo	ognormal Dis	tribution Usi	ng Imputed	Non-Detects		
2243					riginal Scale	0.682	-		- • •		n Log Scale	-0.52
2244 2245					riginal Scale	0.402					n Log Scale	0.52
2245			!	95% UTL95		1.754			95%	BCA UTL959	-	2.15
2247		g	95% Bootstrap	(%) UTL95	% Coverage	2.2				(95% UPL (t)	1.438
2248				90% P	ercentile (z)	1.158				95% P	ercentile (z)	1.399
2249				99% P	ercentile (z)	1.995					95% USL	2.723
2250						I	I					
4400												

				_		T 0			т . т	17	
2251	A	В	C Stati	D E stics using KM estimate	F s on Logged [G Data and Assu	H Iming Logno	rmal Distri	bution	K	L
2251				KM Mean of Logged D					(Lognormal)95%	6 Coverage	1.424
2252				KM SD of Logged D					95% KM UPL (L	-	1.244
2253			95% KM	1 Percentile Lognormal					95% KM USL (L	Lognormal)	1.921
2254 2255					` 1					- 1	
2256				Background DL	2 Statistics As	suming Logno	ormal Distrib	oution			
2257				Mean in Original Sc	le 0.634				Mean in	Log Scale	-0.583
2258				SD in Original Sc	le 0.391				SD in	Log Scale	0.482
2259				95% UTL95% Covera	ge 1.52				9:	5% UPL (t)	1.265
2260				90% Percentile	z) 1.035				95% Pe	ercentile (z)	1.233
2261				99% Percentile	z) 1.712					95% USL	2.284
2262			DL/2 is r	not a Recommended M	thod. DL/2 pro	vided for con	nparisons an	d historica	I reasons.		
2263											
2264				Nonparame	ic Distribution	Free Backgro	ound Statisti	cs			
2265				Data appear to follow	a Discernible I	Distribution at	5% Signific	ance Level	<u> </u>		
2266											
2267			Nonpara	metric Upper Limits for	BTVs(no disti	nction made b	etween dete	ects and no	ondetects)		
2268				Order of Statistic	, r 45			95	5% UTL with95%	6 Coverage	1.6
2269		Ap	prox, f used	to compute achieved	CC 1.184	Approxima	te Actual Co	nfidence C	Coefficient achiev	ved by UTL	0.677
2270	Approxi	mate Sample	Size neede	ed to achieve specified	C 93					95% UPL	1.53
2271				95% U	SL 2.4				95% KM Cheb	yshev UPL	2.278
2272											
2273		Note: The	use of USL	tends to yield a conser	ative estimate	of BTV, espe	ecially when	the sample	e size starts exce	eeding 20.	
2275		Thoustons					oproconte o	hackaroun		of outliers	
2274		rnereiore	e, one may u	se USL to estimate a E	IV only when	tne data set re	epresents a	Dackgroun	d data set tree o	or outliers	
2274 2275		rnererore	, one may u	and consists of obse						or outliers	
2275					rvations collec	ted from clea	n unimpacte	d locations	S.		
2275 2276		TI	he use of U	and consists of obse	rvations collect	ted from clean	n unimpacte	d locations negatives	s. provided the dat	ta	
2275 2276 2277		TI	he use of U	and consists of obse	rvations collect	ted from clean	n unimpacte	d locations negatives	s. provided the dat	ta	
2275 2276 2277 2278	TOTAL PH	TI	he use of U	and consists of obse	rvations collect	ted from clean	n unimpacte	d locations negatives	s. provided the dat	ta	
2275 2276 2277 2278 2279	TOTAL PH	TI	he use of U	and consists of obse	rvations collect	ted from clean	n unimpacte	d locations negatives	s. provided the dat	ta	
2275 2276 2277 2278 2279 2280	TOTAL PH	TI	he use of U	and consists of obse	rvations collections collections collections collections collections when many collections	ted from clean	n unimpacte	d locations negatives	s. provided the dat	ta	
2275 2276 2277 2278 2279 2280 2281	TOTAL PH	TI	he use of US presents a b	and consists of obse	rvations collections collections collections collections when many collections collections are set of the collections collections collections collections are set of the collections collections collections are set of the collections collections collections are set of the	eted from clea n false positiv onsite observa	n unimpacte	d locations negatives o be comp	s. provided the dat	ta ∇.	0
2275 2276 2277 2278 2279 2280 2281 2282	TOTAL PH	TI	he use of US presents a b	and consists of obse SL tends to provide a b packground data set an	rvations collections collectio	eted from clea n false positiv onsite observa	n unimpacte	d locations negatives o be comp	s. provided the dat ared with the BT	ta ∇.	0
2275 2276 2277 2278 2279 2280 2281	TOTAL PH	TI	he use of US presents a b	and consists of obse SL tends to provide a b sackground data set an	rvations collections collections collections collections collections depends on the collection collections collect	eted from clea n false positiv onsite observa	n unimpacte	d locations negatives o be comp	s. provided the dat ared with the BT	ta TV. Discriptions	0 45
2275 2276 2277 2278 2279 2280 2281 2282 2283	TOTAL PH	TI	Tota	and consists of obsests SL tends to provide a because and consists of obsests ackground data set and ackground data set ackground data set and ackground data set ackground data se	General ns 47 ns 2 ets 2	eted from clea n false positiv onsite observa	n unimpacte	d locations negatives o be comp	provided the data	oservations	
2275 2276 2277 2278 2279 2280 2281 2282 2283 2284	TOTAL PH	TI	Tota	and consists of obsets SL tends to provide a beackground data set and I Number of Observation or of Distinct Observation Number of Dete	General ns 47 ns 2 ets 2 ets 1	eted from clea n false positiv onsite observa	n unimpacte	d locations negatives o be comp	provided the data ared with the BT ber of Missing Observer of Number of Number of Distinct Number of Distinc	oservations	45
2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285	TOTAL PH	TI	Tota	and consists of obsests SL tends to provide a because and consists of obsests ackground data set and ackground data set ackground da	General Ins 47 Ins 2 Ins 2 Ins 1 Ins 1 Ins 2 Ins 2 Ins 1 Ins 1 Ins 1 Ins 2 Ins 2 Ins 1 Ins 1 Ins 1 Ins 1 Ins 2 Ins 2 Ins 1 Ins	eted from clea n false positiv onsite observa	n unimpacte	d locations negatives o be comp	provided the data ared with the BT ber of Missing Observer of Number of Number of Distinct Number of Distinc	bservations on-Detects on-Detects Non-Detect	45 2
2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286	TOTAL PH	TI	Tota	and consists of obsets SL tends to provide a beta background data set and an ackground data set and ackground data set ackground data set and ackground data set and ackground data set ackgr	General Ins 47 Ins 2 Its 1 Its	eted from clea n false positiv onsite observa	n unimpacte	d locations negatives o be comp	provided the data ared with the BT ber of Missing Ob Number of Number of Distinct Number of Distinct Number of Distinct Number of Distinct Number of Maximum Number of Maximum Number of Maximum Number of Maximum Number of Number of Distinct Number of Distinct Number of Maximum Number of Number of Number of Distinct Number of	bservations on-Detects on-Detects Non-Detect	45 2 0.005
2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287	TOTAL PH	TI	Tota	and consists of obsets SL tends to provide a beackground data set and I Number of Observation Of Distinct Observation Number of Detection of Distinct Dete	General Ins 47 Ins 2 Its 1 Its	eted from clea n false positiv onsite observa	n unimpacte	d locations negatives o be comp	provided the data ared with the BT ber of Missing Observed Minimum Number of Number of Distinct Number of Distinct Number of Distinct Number of Distinct Number of Minimum Number of Number of Distinct Number of Distinct Number of Distinct Number of Distinct Number of Number of Number of Distinct Number of Number of Distinct Number of Number of Distinct Number of	pservations on-Detects on-Detects Non-Detect Non-Detect	45 2 0.005 0.01
2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288	TOTAL PH	TI	Tota Numbe	and consists of obsets SL tends to provide a beta consists of obsets ackground data set and	General s 47 ns 2 cts 2 cts 1 cct 0.01 cct 0.01 cd 0 ed 0 ed 0.01	eted from clea n false positiv onsite observa	n unimpacte	d locations negatives o be comp Numb	provided the data ared with the BT ber of Missing Observed Minimum Number of Number of Distinct Number of Distinct Number of Distinct Number of Distinct Number of Minimum Number of Number of Distinct Number of Distinct Number of Distinct Number of Distinct Number of Number of Number of Distinct Number of Number of Distinct Number of Number of Distinct Number of	pservations on-Detects on-Detect Non-Detect on-Detects D Detected	45 2 0.005 0.01 95.74%
2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289		ENOLICS	Tota Numbe	and consists of obsets SL tends to provide a beackground data set and	General Ins 47 Ins 2 Instance to the control of the	sted from clea n false positiv nnsite observa Statistics	n unimpacte es and false itions need t	Numb	provided the data ared with the BT ared	oservations on-Detects on-Detect Non-Detect on-Detects D Detected ogged Data	45 2 0.005 0.01 95.74%
2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290		ENOLICS Warning: On	Tota Numbe	and consists of obsets SL tends to provide a beackground data set and sackground data set and sackgrou	General ms 47 ms 2 tts 2 tts 1 ect 0.01	sted from clea In false positive Insite observationsite observation Statistics Or any other s	n unimpacte es and false itions need t	Numb	provided the data ared with the BT ared with the BT ber of Missing Observed of Missing Observed of Distinct Notes of Dis	con-Detects con-Detects con-Detects con-Detects con-Detect con-Detects con-Det	45 2 0.005 0.01 95.74% 0
2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2290 2291		ENOLICS Warning: On	Tota Numbe	and consists of obsets SL tends to provide a beackground data set and	General ms 47 ms 2 tts 2 tts 1 ect 0.01	sted from clea In false positive Insite observationsite observation Statistics Or any other s	n unimpacte es and false itions need t	Numb	provided the data ared with the BT ared with the BT ber of Missing Observed of Missing Observed of Distinct Notes of Dis	con-Detects con-Detects con-Detects con-Detects con-Detect con-Detects con-Det	45 2 0.005 0.01 95.74% 0
2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291		ENOLICS Warning: On	Tota Numbe	and consists of obsets SL tends to provide a beackground data set and sackground data set and sackgrou	General ms 47 ms 2 tts 2 tts 1 ect 0.01	sted from clea In false positive Insite observationsite observation Statistics Or any other s	n unimpacte es and false itions need t	Numb	provided the data ared with the BT ared with the BT ber of Missing Observed of Missing Observed of Distinct Notes of Dis	con-Detects con-Detects con-Detects con-Detects con-Detect con-Detects con-Det	45 2 0.005 0.01 95.74% 0
2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2290 2291 2292 2293		ENOLICS Warning: On	Tota Numbe	and consists of obsets SL tends to provide a beackground data set and sackground data set and sackgrou	General when many company when many company depends and the second when many company depends and the second when many company depends are second and the second depends and the second depends are second depends and the second depends and the second depends are second depends are second depends and the second depends are second depends are second depends and the sec	sted from clea In false positive Insite observationsite observation Statistics Or any other s Project Team	n unimpacte es and false itions need t oftware) sho to estimate	Numb Numb Numb	provided the data ared with the BT ared with the BT ber of Missing Observed of Missing Observed of Distinct Notes of Dis	con-Detects con-Detects con-Detects con-Detects con-Detect con-Detects con-Det	45 2 0.005 0.01 95.74% 0
2275 2276 2277 2278 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293		ENOLICS Warning: On	Tota Numbe	and consists of obsets SL tends to provide a beackground data set and sackground data set and sackgrou	General when many company when many company depends and the second when many company depends and the second when many company depends are second and the second depends and the second depends are second depends and the second depends and the second depends are second depends are second depends and the second depends are second depends are second depends and the sec	sted from clea In false positive Insite observationsite observation Statistics Or any other s Project Team	n unimpacte es and false itions need t oftware) sho to estimate	Numb Numb Numb	provided the data ared with the BT ared with the BT ber of Missing Observed of Missing Observed of Distinct Notes of Dis	con-Detects con-Detects con-Detects con-Detects con-Detect con-Detects con-Det	45 2 0.005 0.01 95.74% 0
2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2290 2291 2292 2293 2294 2295		ENOLICS Warning: On	Tota Numbe	and consists of obsets SL tends to provide a beackground data set and sackground data set and sackgrou	General when many company when many company depends and the second when many company depends and the second when many company depends are second and the second depends and the second depends are second depends and the second depends and the second depends are second depends are second depends and the second depends are second depends are second depends and the sec	sted from clea In false positive Insite observationsite observation Statistics Or any other s Project Team	n unimpacte es and false itions need t oftware) sho to estimate	Numb Numb Numb	provided the data ared with the BT ared with the BT ber of Missing Observed of Missing Observed of Distinct Notes of Dis	con-Detects con-Detects con-Detects con-Detects con-Detect con-Detects con-Det	45 2 0.005 0.01 95.74% 0
2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2290 2291 2292 2293 2294 2295 2296 2297		ENOLICS Warning: On ested to use a	Tota Numbe	and consists of obsets SL tends to provide a beackground data set and sackground data set and sackgrou	General when many company when many company depends and the second when many company depends and the second when many company depends are second and the second depends and the second depends are second depends and the second depends and the second depends are second depends are second depends and the second depends are second depends are second depends and the second depends depends are second depends dep	sted from clea In false positive Insite observationsite observation Statistics Or any other s Project Team	n unimpacte es and false itions need t oftware) sho to estimate	Numb Numb Numb	provided the data ared with the BT ared with the BT ber of Missing Observed of Missing Observed of Distinct Notes of Dis	con-Detects con-Detects con-Detects con-Detects con-Detect con-Detects con-Det	45 2 0.005 0.01 95.74% 0
2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2288 2289 2290 2291 2292 2293 2294 2295 2297	It is sugge	ENOLICS Warning: On ested to use a	Tota Numbe	and consists of obsets SL tends to provide a beackground data set and sackground data set and sackgrou	General when many company when many company depends and the second secon	sted from clea In false positive Insite observationsite observation Statistics Or any other s Project Team	n unimpacte es and false itions need t oftware) sho to estimate	Numb Numb Numb	provided the data ared with the BT ared with the BT ber of Missing Observed of Missing Observed of Distinct Notes of Dis	con-Detects con-Detects con-Detects con-Detects con-Detect con-Detects con-Det	45 2 0.005 0.01 95.74% 0

			_					_					
2301	Α	В	C To	tal Number	E of Observat	ions	F 47	G	Н	l I Number	of Missing (K Observations	L 0
2302			Num	ber of Distin	ct Observat	ions	29						
2303				Nu	mber of Det	ects	39				Number of	Non-Detects	8
2304				Number of	Distinct Det	ects	28			Numbe	er of Distinct	Non-Detects	1
2305				1	/linimum De	etect	0.11				Minimum	n Non-Detect	0.1
2306				N	laximum De	etect	10.1				Maximum	Non-Detect	0.1
2307				Va	riance Dete	cted	3.275				Percent	Non-Detects	17.02%
2308					Mean Dete	cted	0.792				;	SD Detected	1.81
2309			Ме	an of Detect	ed Logged I	Data	-1.078			SD	of Detected	Logged Data	1.04
2310								L				I.	
2311								nd Threshold	Values (BT	Vs)			
2312			Т	olerance Fac	tor K (For U	JTL)	2.074				d2m	nax (for USL)	2.933
2313													
2314								t on Detects	Only				
2315				-	lk Test Stat		0.397			•	k GOF Test		
2316			5%	Shapiro Wi			0.939		Data No	ot Normal at §		nce Level	
2317					rs Test Stat		0.401				GOF Test		
2318				5% Lilliefo	rs Critical V		0.14			ot Normal at §	5% Significa	nce Level	
2319					Data	Not	Normal at 5	% Significan	ce Level				
2320													
2321				Kaplan I			*	stics Assum	ing Normal D	Distribution			
2322					KM M		0.674					KM SD	1.648
2323					_95% Cove		4.092					6 KM UPL (t)	3.47
2324					M Percentile	. ,	2.786					Percentile (z)	3.385
2325				99% K	M Percentile	e (z)	4.508				9	95% KM USL	5.507
2326													
2327				DL/2 Si				stics Assumir	ng Normal D	istribution			
2328						lean	0.666					SD	1.669
2329					_95% Cove	•	4.127					95% UPL (t)	3.497
2330					% Percentile	` '	2.805				95% F	Percentile (z)	3.411
2331					% Percentile	` '	4.548					95% USL	5.56
2332			DL/2	is not a reco	mmenaea n	netno	od. DL/2 prov	vided for con	nparisons an	nd historical r	easons		
2333					0		T D.	44-4 Ob					
2334				Δ.	D Test Stat			tected Obse		<u></u>	#== COF To	_4	
2335							4.524			nderson-Dar	_	ınificance Lev	·=1
2336					D Critical V		0.792	D				<u></u>	eı
2337										Kolmogorov-			·al
2338				5% K-	S Critical V		0.147	ed at 5% Sigr			eu at 5% SIG	nificance Lev	el .
2339					Data NOt G	aamm	ia Distribute	u at 5% Sigi	micarice Lev	'CI			
2340					0	nme '	Statistics s-	Datastad D	ata Only				
2341								Detected Da	ata Offiy	le e	etar (hiao ac	rected MI EV	0.676
2342				-	k hat (M Theta hat (M		0.713 1.11				`	rrected MLE)	0.676 1.173
2343					nu hat (M	1	55.65			ineta	•	as corrected)	52.7
2344				MLE Mean	•	- 1	0.792				iiu Stat (Dla	as correcteu)	J2. <i>1</i>
2345					(bias correc		0.792			95% Parcor	ntile of Chica	uare (2kstar)	4.659
2346				IVILE 30	(nias coi160	i c u)	0.304			33 % FEICEI	iuie oi oilisq	uait (ZKSläi)	4.008
2347					Gamma !	BU6	Statistics	sing Imputed	Non-Detact	•			
2348			CDOS ~	nav not bo						servations at	multiple DLs	•	
2349		GROS mo		-								e.g., <15-20)	
2350		GRUS III	y HOLD e U	ocu wiieli KS	iai oi ueteci	15 IS S	oman Such a	s > 1.0, espe	cially wil e n t	ine sample S	ize is silidii (e.y., ►10-20)	

	A B C D	Е	F	G H I J K	L
2351			<u> </u>	yield incorrect values of UCLs and BTVs	
2352			•	en the sample size is small.	
2353	For gamma distributed detected of	data, BTVs a		ay be computed using gamma distribution on KM estimates	
2354		Minimum	0.01	Mean	0.659
2355		Maximum	10.1	Median	0.22
2356		SD	1.672	CV	2.536
2357	!	k hat (MLE)	0.503	k star (bias corrected MLE)	0.485
2358	Theta	a hat (MLE)	1.31	Theta star (bias corrected MLE)	1.358
2359	nı	u hat (MLE)	47.3	nu star (bias corrected)	45.61
2360	MLE Mean (bias	s corrected)	0.659	MLE Sd (bias corrected)	0.946
2361	95% Percentile of Chisqu	are (2kstar)	3.768	90% Percentile	1.794
2362	95%	6 Percentile	2.559	99% Percentile	4.446
2363	-		-	Gamma ROS Statistics on Imputed Data	
2364	Upper Limits u	sing Wilson	Hilferty (WH	l) and Hawkins Wixley (HW) Methods	
2365		WH	HW	WH	HW
2366	95% Approx. Gamma UTL with 95% Coverage	2.977	3.073	95% Approx. Gamma UPL 2.18	2.162
2367	95% Gamma USL	5.469	6.191		
2368					
2369				neters using KM Estimates	
2370		Mean (KM)	0.674	SD (KM)	1.648
2371	Val	riance (KM)	2.716	SE of Mean (KM)	0.244
2372		k hat (KM)	0.168	k star (KM)	0.171
2373	,	nu hat (KM)	15.75	nu star (KM)	16.07
2374		eta hat (KM)	4.027	theta star (KM)	3.944
2375	80% gamma pero	` '	0.809	90% gamma percentile (KM)	2.028
2376	95% gamma pero	centile (KM)	3.611	99% gamma percentile (KM)	8.09
2377					
2378	·		=	g gamma distribution and KM estimates	
2379	Upper Limits u	-) and Hawkins Wixley (HW) Methods	
2380		WH	HW	WH	HW
2381	95% Approx. Gamma UTL with 95% Coverage	2.674	2.557	95% Approx. Gamma UPL 2.014	1.884
2382	95% KM Gamma Percentile	1.933	1.804	95% Gamma USL 4.679	4.746
2383					
2384				etected Observations Only	
2385	Shapiro Wilk To		0.848	Shapiro Wilk GOF Test	
2386	5% Shapiro Wilk Ci		0.939	Data Not Lognormal at 5% Significance Level	
2387		est Statistic	0.151	Lilliefors GOF Test	
2388	5% Lilliefors Ci		0.14	Data Not Lognormal at 5% Significance Level	
2389		Data Not Lo	ognormal at	5% Significance Level	
2390	<u> </u>				
2391				ognormal Distribution Using Imputed Non-Detects	
2392	Mean in Ori	-	0.664	Mean in Log Scale	-1.47
2393		iginal Scale	1.67	SD in Log Scale	1.302
2394	95% UTL95%	·	3.418	95% BCA UTL95% Coverage	8.051
2395	95% Bootstrap (%) UTL95%	•	8.714	95% UPL (t)	2.091
2396		ercentile (z)	1.219	95% Percentile (z)	1.956
2397	99% Pe	ercentile (z)	4.748	95% USL	10.45
0000					
2398	*				
2398 2399	Statistics using KM KM Mean of L		n Logged D	ata and Assuming Lognormal Distribution 95% KM UTL (Lognormal)95% Coverage	2.398

	1	,	1	1				,	_		Ţ		
0404	Α	В	С	M SD of L	E Logged Data	F 1.042	G	Н		l g	J 95% KM UPL	(Lognormal)	L 1.618
2401			95% KM	Percentile Lo							95% KM USL	` •	5.868
2402					· · · ·							, ,	
2403 2404				Backg	round DL/2 S	Statistics Ass	suming Logn	ormal Distri	ibution				
2405				Mean in O	riginal Scale	0.666					Mean	in Log Scale	-1.404
2406				SD in O	riginal Scale	1.669					SD	in Log Scale	1.193
2407				95% UTL95	% Coverage	2.916						95% UPL (t)	1.859
2408				90% F	ercentile (z)	1.133					95% F	Percentile (z)	1.748
2409				99% P	ercentile (z)	3.942						95% USL	8.126
2410			DL/2 is n	ot a Recomm	ended Meth	od. DL/2 pro	vided for cor	mparisons a	nd histo	orical	reasons.	<u> </u>	
2411													
2412				No	nparametric	Distribution	Free Backgr	ound Statist	tics				
2413				[Data do not fo	ollow a Disco	ernible Distri	bution (0.05	5)				
2414													
2415			Nonpara	metric Upper		•	ction made	between det	tects an	d non	idetects)		
2416				Order	of Statistic, r						% UTL with95	•	5.48
2417		· · · · · · · · · · · · · · · · · · ·		to compute a			Approxima	ate Actual C	onfiden	ce Co	efficient achie	•	0.688
2418	Approxii	mate Sample	Size neede	d to achieve s								95% UPL	4.596
2419					95% USL	10.1					95% KM Che	byshev UPL	7.934
2420													
2421											size starts ex	_	
2422		Therefore	e, one may us			-					data set free	e of outliers	
2423					ts of observa								
2424											provided the d		
2425		re	presents a b	ackground da	ata set and w	hen many o	nsite observ	ations need	to be c	ompa	red with the B	BTV.	
2426													
2427	BENZENE												
2428						General	Ctatiatica						
2429			Total	Number of C)hear/ations		Statistics		NI NI	umbo	r of Missing C)hearyations	0
2430				r of Distinct C					IN	uiiibe	i or ivilsality c	DDSEI VALIONS	0
2431			Numbe		er of Detects	-					Number of	Non-Detects	47
2432			N	umber of Dist						dumb	er of Distinct		1
2433					mum Detect					Turrib		Non-Detect	1
2434					mum Detect							Non-Detect	1
2435					ce Detected							Non-Detects	100%
2436				Me	an Detected							SD Detected	N/A
2437			Mean	of Detected I						SD	of Detected I		N/A
2438												55 - 5	
2439		Warr	ning: All obse	ervations are	Non-Detects	(NDs), there	efore all stat	istics and es	stimates	shou	ıld also be NE	Os!	
2440 2441											est detection		
2441		•	•		<u> </u>						neters (e.g., E		
2442													
2444				The	data set for	variable BE	NZENE was	not process	sed!				
2445													
2446													
2447	4 A DIDDA	MOETHANE											
2448													
2449						General	Statistics						
2450			Total	Number of C	Observations	47			N	umbe	r of Missing C	Observations	0
_ 100	1					l .	1						

			-	_	ı			T													
2451	A	В		C Number	of Distir	nct Obs	E ervations	F 1		G		Н		<u> </u>		J			K		<u>L</u>
2451					Nu	mber c	of Detects	0							١	Number	of No	on-l	Detects	47	7
2452				Nı	ımber of	Distino	t Detects	0						Num	ber	of Distin	ct No	on-l	Detects	1	
2453						Minimu	ım Detect	: N/A								Minim	um N	Von	-Detect	1	
2454					1	/laximu	ım Detect	: N/A								Maxim	um N	lon	-Detect	1	
2455					Va	riance	Detected	N/A								Perce	nt No	on-l	Detects	100)%
2456						Mean	Detected	N/A									SI	D D	etected	N/A	A
2457				Mean	of Detec	ted Loc	ged Data	N/A						S	D of	Detecte	d Lc	aae	ed Data	N/A	A
2458																					
2459 2460		War	rning: A	All obse	rvations	are No	n-Detect:	s (NDs), the	erefor	e all sta	tistics	and es	timat	es sh	ould	also be	NDs	i!		-	-
2461		Specif	fically,	sample	mean, l	JCLs, l	JPLs, and	l other stati	stics	are also	NDs	lying be	elow t	the lar	rgest	detection	on lin	nit!			
2462	7	The Project	Team r	may de	cide to u	se alte	native si	te specific v	/alues	to esti	mate (environi	menta	al para	amet	ers (e.g	., EP	' С, Г	BTV).		
2463																					
2464					The d	ata set	for variat	le 1,2-DIBF	ROMO	DETHA	NE wa	as not p	roces	sed!							
2465																					
2466																					
	1,1-DICHLO	DROETHAN	1E																		
2468																					
2469								Genera	al Stat	tistics											
2470				Total	Number	of Obs	ervations	47						Numb	oer o	f Missin	g Ob	ser	vations	0	
2471			١	Number	of Distir	ct Obs	ervations	1													
2472					Nι	mber c	of Detects	0							1	Number	of No	on-[Detects	47	7
2473				Νι	ımber of	Distino	t Detects	0						Num	ber	of Distin	ct No	on-[Detects	1	
2474						Minimu	ım Detect	N/A								Minim	um N	lon-	-Detect	1	
2475					ľ	/laximu	ım Detect	N/A								Maxim	um N	lon-	-Detect	1	
2476					Va	riance	Detected	N/A								Perce	nt No	on-[Detects	100)%
2477							Detected												etected		
2478				Mean	of Detec	ted Log	ged Data	N/A						S	SD of	Detecte	:d Lo	gge	ed Data	N/A	4
2479																					
2480								s (NDs), the													
2481		•	•	•	-			l other stati							•						
2482	7	The Project	Team	may de	cide to u	se alte	native sit	te specific v	/alues	to esti	mate (environi	menta	al para	amet	ers (e.g	., EP	ا ,C,	BTV).		
2483								4 4 5101		OFT. 14											
2484					The da	ita set 1	or variab	le 1,1-DICH	ILOR	OETHA	NE W	as not p	oroce	ssed!							
2485																					
2486	1 1 DICHI (DOETHEN																			
2487	I, I-DICHLO	DROETHEN	NE.																		
2488								Genera	al Stat	tietico											
2489				Total	Number	of Obe	ervations		ai Oldi	いついしち				Numb	ner o	f Missin	a ∩h	Ser	vations	0	
2490			N				ervations							· vaiiik	JUI U	. 1411001111	9 00	-501	- 440115		
2491							of Detects								N	Number	of N	l	Detects	47	7
2492				Nı			t Detects							Num		of Distin					
2493				140			m Detect							. 1011					-Detect		
2494							ım Detect									Maxim					
2495							Detected												Detects		
2496							Detected												etected		
2497				Mean	of Detec		ged Data							S	D of	Detecte					
2498								1													
2499		Wai	rnina: A	All obse	rvations	are No	n-Detect	s (NDs), the	erefor	e all sta	itistics	and es	timat	es sh	ould	also be	NDs	<u></u>			
2500			······································	5550				(. 5.01	010					. a.w			_			

	A B C D E	F	G	Н	I	J		K	L
2501	Specifically, sample mean, UCLs, UPLs, and	other statis	stics are also N	IDs lying be	low the lar	gest detec	tion limit	!	
2502	The Project Team may decide to use alternative site	e specific v	alues to estima	ate environn	nental para	ameters (e	.g., EPC,	BTV).	
2503									
2504	The data set for variable	€ 1,1-DICH	LOROETHEN	E was not p	rocessed!				
2505									
2506									
2507	1.2 DICH ODOETHANE								
2508									
2509		Genera	I Statistics						
2510	Total Number of Observations	47			Numb	er of Miss	ing Obse	rvations	0
2511	Number of Distinct Observations	1							
2512	Number of Datasta	0				Numbe	er of Non-	-Detects	47
2513	Number of Distinct Detects	0			Num	ber of Dist	inct Non-	-Detects	1
2514	Minimum Datast	N/A				Mini	mum Nor	n-Detect	1
2515	Maximum Dotoct	N/A				Maxi	mum Nor	n-Detect	1
2516	Variance Detected	N/A				Pero	cent Non-	-Detects	100%
	Maan Datastad	N/A					SDD	Detected	N/A
2517 2518	Mann of Detected Logged Dete	N/A			S	D of Detec	ted Logg	jed Data	N/A
2519	Warning, All phogrations are Non Detecto	(NDs), the	refore all statis	stics and est	imates sho	ould also b	e NDs!		
2520	Specifically cample mean LICLs LIDLs and							!	
2521	The Project Team may decide to use alternative site					_			
2522		•			•	•	• .		
2522									
2523	The data set for veriable	e 1.2-DICH	LOROETHAN	E was not p	rocessed!				
2524	The data set for variable	e 1,2-DICH	ILOROETHAN	E was not p	rocessed!				
2524 2525	The data set for variable	∍ 1,2-DICH	LOROETHAN	E was not p	rocessed!				
2524 2525 2526	The data set for variable	e 1,2-DICH	LOROETHAN	E was not p	rocessed!				
2524 2525 2526 2527	The data set for variable cis 1,2-DICHLOROETHENE	∍ 1,2-DICH	ILOROETHAN	E was not p	rocessed!				
2524 2525 2526 2527 2528	The data set for variable cis 1,2-DICHLOROETHENE		I Statistics	E was not p	rocessed!				
2524 2525 2526 2527 2528 2529	The data set for variable cis 1,2-DICHLOROETHENE			E was not p		per of Miss	ing Obse	ervations	0
2524 2525 2526 2527 2528 2529 2530	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations	Genera		E was not p		per of Miss	ing Obse	rvations	0
2524 2525 2526 2527 2528 2529 2530 2531	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations	Genera 47		E was not p					
2524 2525 2526 2527 2528 2529 2530 2531 2532	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Detects	Genera 47 1		E was not p	Numb	Numbe	er of Non-	-Detects	47
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detects	Genera 47 1 0		E was not p	Numb	Numbe	er of Non-	-Detects	
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Detects Number of Distinct Detects Minimum Detect Maximum Detect	Genera 47 1 0		E was not pr	Numb	Numbe ber of Dist Mini	er of Non-	-Detects -Detects	47 1
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Detects Number of Distinct Detects Minimum Detect Maximum Detect	Genera 47 1 0 N/A		E was not p	Numb	Number ber of Dist Mini Maxi	er of Non- tinct Non- mum Nor mum Nor	-Detects -Detects 1-Detect	47 1
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected	Genera 47 1 0 0 N/A N/A		E was not pr	Numb	Number ber of Dist Mini Maxi	er of Non- tinct Non- mum Nor mum Nor- cent Non-	-Detects -Detects 1-Detect	47 1 1 1
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected	Genera 47 1 0 0 N/A N/A N/A		E was not p	Numb	Number of Dist Mini Maxi Perd	er of Non- tinct Non- mum Nor mum Nor cent Non- SD D	-Detects -Detects n-Detect n-Detect -Detects -Detects	47 1 1 1 1 100%
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data	Genera 47 1 0 0 N/A N/A N/A N/A		E was not pr	Numb	Number ber of Dist Mini Maxi	er of Non- tinct Non- mum Nor mum Nor cent Non- SD D	-Detects -Detects n-Detect n-Detect -Detects -Detects	47 1 1 1 1 100% N/A
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data	Genera 47 1 0 0 N/A N/A N/A N/A N/A	I Statistics		Numb	Number of Dist Mini Maxi Pero	er of Non- tinct Non- mum Nor mum Nor cent Non- SD D	-Detects -Detects n-Detect n-Detect -Detects -Detects	47 1 1 1 1 100% N/A
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects	Genera 47 1 0 0 N/A N/A N/A N/A N/A (NDs), the	I Statistics	stics and est	Numb Num S	Number of Dist Mini Maxi Pero D of Detection	er of Non- tinct Non- mum Nor mum Nor- cent Non- SD E cted Logg	-Detects -Detects n-Detect n-Detect -Detects Detected ged Data	47 1 1 1 1 100% N/A
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and	Genera 47 1 0 N/A N/A N/A N/A N/A N/A Other statis	I Statistics refore all statistics are also N	stics and est	Numb Num S simates should be lared to the la	Number of Dist Mini Maxi Pero D of Detect pull also be gest detect	er of Non- tinct Non- mum Nor mum Nor cent Non- SD D cted Logg	-Detects -Detects n-Detect -Detect -Detects Detects Detected ded Data	47 1 1 1 1 100% N/A
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Wean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site	Genera 47 1 0 N/A N/A N/A N/A N/A N/A Other statis	I Statistics refore all statistics are also N	stics and est	Numb Num S simates should be lared to the la	Number of Dist Mini Maxi Pero D of Detect pull also be gest detect	er of Non- tinct Non- mum Nor mum Nor cent Non- SD D cted Logg	-Detects -Detects n-Detect -Detect -Detects Detects Detected ded Data	47 1 1 1 1 100% N/A
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543	Cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site	Genera 47 1 0 0 N/A N/A N/A N/A N/A ONA N/A Solution of the statistic expecific vision of the statistic expectation of the statistic expec	I Statistics Prefore all statistics are also Nalues to estimate	stics and est	Numb S imates sho	Number of Dist Mini Maxi Perc D of Detect puld also begest detect ameters (e	er of Non- tinct Non- mum Nor mum Nor cent Non- SD D cted Logg	-Detects -Detects n-Detect -Detect -Detects Detects Detected ded Data	47 1 1 1 1 100% N/A
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2540 2541 2542 2543 2544	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Wean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site The data set for variable of	Genera 47 1 0 0 N/A N/A N/A N/A N/A ONA N/A Solution of the statistic expecific vision of the statistic expectation of the statistic expec	I Statistics Prefore all statistics are also Nalues to estimate	stics and est	Numb S imates sho	Number of Dist Mini Maxi Perc D of Detect puld also begest detect ameters (e	er of Non- tinct Non- mum Nor mum Nor cent Non- SD D cted Logg	-Detects -Detects n-Detect -Detect -Detects Detects Detected ded Data	47 1 1 1 1 100% N/A
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545	The data set for variable cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site The data set for variable of	Genera 47 1 0 N/A N/A N/A N/A N/A N/A Other statis	I Statistics Prefore all statistics are also Nalues to estimate	stics and est	Numb S imates sho	Number of Dist Mini Maxi Perc D of Detect puld also begest detect ameters (e	er of Non- tinct Non- mum Nor mum Nor cent Non- SD D cted Logg	-Detects -Detects n-Detect -Detect -Detects Detects Detected ded Data	47 1 1 1 1 100% N/A
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2540 2541 2542 2543 2544 2545 2546	The data set for variable Cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site The data set for variable of	Genera 47 1 0 N/A N/A N/A N/A N/A N/A Other statis	I Statistics Prefore all statistics are also Nalues to estimate	stics and est	Numb S imates sho	Number of Dist Mini Maxi Perc D of Detect puld also begest detect ameters (e	er of Non- tinct Non- mum Nor mum Nor cent Non- SD D cted Logg	-Detects -Detects n-Detect -Detect -Detects Detects Detected ded Data	47 1 1 1 1 100% N/A
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2540 2541 2542 2543 2544 2545 2545	The data set for variable Cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site The data set for variable of trans 1,2-DICHLOROETHENE	Genera 47 1 0 N/A N/A N/A N/A N/A N/A Other statis	I Statistics Prefore all statistics are also Nalues to estimate	stics and est	Numb S imates sho	Number of Dist Mini Maxi Perc D of Detect puld also begest detect ameters (e	er of Non- tinct Non- mum Nor mum Nor cent Non- SD D cted Logg	-Detects -Detects n-Detect -Detect -Detects Detects Detected ded Data	47 1 1 1 1 100% N/A
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2540 2541 2542 2543 2544 2545 2544 2545 2546 2547 2548	Cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site The data set for variable of trans 1,2-DICHLOROETHENE	Genera 47 1 0 N/A N/A N/A N/A N/A N/A C(NDs), the other statise specific voices 1,2-DIC	refore all statissics are also Nalues to estima	stics and est	Numb S imates sho	Number of Dist Mini Maxi Perc D of Detect puld also begest detect ameters (e	er of Non- tinct Non- mum Nor mum Nor cent Non- SD D cted Logg	-Detects -Detects n-Detect -Detect -Detects Detects Detected ded Data	47 1 1 1 1 100% N/A
2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2540 2541 2542 2543 2544 2545 2546 2547	Cis 1,2-DICHLOROETHENE Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site The data set for variable of trans 1,2-DICHLOROETHENE	Genera 47 1 0 N/A N/A N/A N/A N/A N/A C(NDs), the other statise specific voices 1,2-DIC	I Statistics Prefore all statistics are also Nalues to estimate	stics and est	Numb Num S imates sho low the lar mental para	Number of Dist Mini Maxi Perc D of Detect puld also begest detect ameters (e	er of Non- tinct Non- mum Nor mum Nor cent Non- SD E ted Logg e NDs! etion limit!	-Detects -Detects n-Detect -Detects Detects Detected Jed Data	47 1 1 1 1 100% N/A

	Α	В		С	\Box	D	Е		F	G	Н		ı		J	K	L	
2551		•		Num	ber of I	Distinct (Observat	tions	1		•	•				•		
2552						Numb	er of Det	tects	0					Nu	mber of	Non-Detect	s 47	
2553					Numb	er of Dis	tinct Det	tects	0				Numl	oer of	Distinct	Non-Detect	s 1	
2554						Min	imum De	etect	N/A						Minimur	n Non-Detec	t 1	
2555						Max	imum De	etect	N/A					٨	/laximur	n Non-Detec	t 1	
2556						Variar	nce Dete	cted	N/A						Percent	Non-Detects	100%	
2557						Ме	an Dete	cted	N/A							SD Detected	d N/A	
2558				Mea	an of D	etected	Logged	Data	N/A				SI	O of D	etected	Logged Data	a N/A	
2559								ļ		<u>I</u>								
2560		W	arnin	g: All ol	oserva	tions are	Non-De	tects	(NDs), there	efore all stati	stics and e	estim	ates sho	uld al	so be N	Ds!		
2561		Spec	cifical	lly, sam	ple me	an, UCL	s, UPLs	, and	other statist	ics are also	NDs lying	belov	v the larg	gest d	etection	limit!		
2562	,	The Projec	t Tea	m may	decide	e to use a	alternativ	e site	e specific val	lues to estim	ate enviro	nmei	ntal para	meter	rs (e.g.,	EPC, BTV).		
2563																		
2564					The	data set 1	for varia	ble tr	ans 1,2-DIC	HLOROETH	ENE was	not p	rocesse	d!				
2565																	-	
2566																	-	
	ETHYLBE	NZENE																
2568																		
2569									General	Statistics								
2570				То	tal Nur	mber of (Observat	tions	47				Numb	er of N	Missing	Observation	s 0	
2571				Num	ber of I	Distinct (Observat	tions	1									
2572						Numb	er of Det	tects	0					Nu	mber of	Non-Detect	s 47	
2573					Numb	er of Dis	tinct Det	tects	0				Numl	per of	Distinct	Non-Detect	s 1	
2574						Min	imum De	etect	N/A					I	Minimur	n Non-Detec	t 1	
2575						Max	imum De	etect	N/A					٨	/laximur	n Non-Detec	t 1	
2576						Variar	nce Dete	cted	N/A						Percent	Non-Detects	100%	
2577						Ме	an Dete	cted	N/A							SD Detected	N/A	
2578				Mea	an of D	etected	Logged	Data	N/A				SI	O of D	etected	Logged Data	a N/A	
2579																		
2580				_					* * * * * * * * * * * * * * * * * * * *	efore all stati								
2581		•		•	•					ics are also			•					
2582		The Projec	t Tea	ım may	decide	e to use a	alternativ	e site	e specific val	lues to estim	ate enviro	nmei	ntal para	meter	rs (e.g.,	EPC, BTV).		
2583																		
2584						The da	ita set fo	r vari	able ETHYL	BENZENE v	vas not pro	ocess	sed!					
2585																		
2586																		
2587	METHYLE	NE CHLOF	RIDE															
2588																		
2589									General	Statistics								
2590						mber of (47				Numb	er of N	Vissing	Observation	s 0	
2591				Num	ber of I	Distinct (1								<u> </u>	
2592							er of Det		0							Non-Detect		
2593					Numb	er of Dis			0				Numl			Non-Detect		
2594							imum De		N/A							n Non-Detec		
2595							imum De		N/A							n Non-Detec		
2596							nce Dete		N/A							Non-Detects		
2597							an Dete		N/A							SD Detected		
2598				Mea	an of D	etected	Logged	Data	N/A				SI	O of D	etected	Logged Data	a N/A	
2599																		
2600		W	arnin	g: All ol	oservat	tions are	Non-De	tects	(NDs), there	efore all stati	stics and e	estim	ates sho	uld al	so be N	Ds!		

	A B C D E	F	G	Н	I	,	J	K	L
2601	Specifically, sample mean, UCLs, UPLs, and	other statis	stics are also N	IDs lying be	low the lar	rgest dete	ection lir	mit!	
2602	The Project Team may decide to use alternative site	e specific v	alues to estim	ate environn	nental para	ameters ((e.g., EF	PC, BTV).	
2603									
2604	The data set for variable	METHYLE	NE CHLORIE	E was not p	rocessed!				
2605									
2606									
2607	TETRACHLOROETHENE								
2608									
2609		Genera	Statistics						
2610	Total Niverbay of Observations	47			Numb	per of Mis	ssing Ob	oservations	0
2611	Number of Distinct Observations	1							
2612	Number of Detects	0				Numl	ber of No	on-Detects	47
2613	Number of Distinct Detects	0			Num	ber of Di	stinct No	on-Detects	1
2614	Minimum Dotoot	N/A				Mir	nimum N	Non-Detect	1
2615	Maximum Dotoct	N/A				Ma	ximum N	Non-Detect	1
	Variance Detected	N/A				Pe	rcent No	on-Detects	100%
2616 2617	Moan Dotacted	N/A					SI	D Detected	N/A
	Moon of Datastad Laggad Data	N/A			S	D of Dete	ected Lo	ogged Data	N/A
2618								·	
2619	Morning, All phogrations are Non Detects	(NDs), the	refore all statis	stics and est	imates sh	ould also	be NDs	s!	
2620	Specifically complement LICLs LIDLs and	* **							
2621	The Project Team may decide to use alternative site					-			
2022									
2622		<u> </u>							
2623	The data set for veriable			IE was not p	rocessed!	<u> </u>			
2623 2624	The data set for variable			IE was not p	rocessed!	!			
2623 2624 2625	The data set for variable			IE was not p	rocessed!	!			
2623 2624 2625 2626	The data set for variable			IE was not p	rocessed!	l			
2623 2624 2625 2626 2627	The data set for variable TOLUENE			IE was not p	processed!	l			
2623 2624 2625 2626 2627 2628	The data set for variable TOLUENE	TETRACH		IE was not p	processed!	l			
2623 2624 2625 2626 2627 2628 2629	The data set for variable TOLUENE	TETRACH	ILOROETHEN	IE was not p			esing Ob	oservations	1
2623 2624 2625 2626 2627 2628 2629 2630	The data set for variable TOLUENE Total Number of Observations	TETRACH	ILOROETHEN	IE was not p			ssing Ob	oservations	1
2623 2624 2625 2626 2627 2628 2629 2630 2631	Toluene Total Number of Observations Number of Distinct Observations	Genera 46	ILOROETHEN	IE was not p		per of Mis			1 46
2623 2624 2625 2626 2627 2628 2629 2630 2631 2632	Toluene Total Number of Observations Number of Distinct Observations Number of Detects	Genera 46 1	ILOROETHEN	IE was not p	Numb	per of Mis	ber of No	oservations on-Detects on-Detects	
2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633	Toluene Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Number of Distinct Detects	Genera 46 1 0	ILOROETHEN	IE was not p	Numb	per of Mis Numl	ber of No	on-Detects	46
2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633	Toluene Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect	Genera 46 1 0 0	ILOROETHEN	IE was not p	Numb	per of Mis Numl liber of Di	ber of No stinct No nimum N	on-Detects	46 1
2623 2624 2625 2626 2627 2628 2630 2631 2632 2633 2634 2635	Toluene Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect	Genera 46 1 0 0 N/A	ILOROETHEN	IE was not p	Numb	oer of Mis Numl nber of Di Mic Ma:	ber of No stinct No nimum N	on-Detects on-Detects Non-Detect	46 1 1
2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636	Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected	Genera 46 1 0 0 N/A N/A	ILOROETHEN	IE was not p	Numb	oer of Mis Numl nber of Di Mic Ma:	ber of No stinct No nimum N ximum N	on-Detects on-Detects Non-Detect	46 1 1 1
2623 2624 2625 2626 2627 2628 2630 2631 2632 2633 2634 2635 2636 2637	Total Number of Observations Number of Distinct Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected	Genera 46 1 0 0 N/A N/A N/A	ILOROETHEN	IE was not p	Numb	oer of Mis Numl nber of Di Ma: Pe	ber of No stinct No nimum N ximum N ercent No	on-Detects on-Detects Non-Detect Non-Detect on-Detects D Detected	46 1 1 1 1 100%
2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638	Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data	Genera 46 1 0 0 N/A N/A N/A N/A	ILOROETHEN	IE was not p	Numb	oer of Mis Numl nber of Di Ma: Pe	ber of No stinct No nimum N ximum N ercent No	on-Detects on-Detect Non-Detect on-Detects	46 1 1 1 1 100% N/A
2623 2624 2625 2626 2627 2628 2630 2631 2632 2633 2634 2635 2636 2637 2638	Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean Detected Mean of Detected Logged Data	Genera 46 1 0 N/A N/A N/A N/A N/A	I Statistics		Numb Num	Numl Numl ober of Di Ma: Pe	ber of No stinct No nimum N ercent No SI ected Lo	on-Detects on-Detect Non-Detect on-Detects D Detected ogged Data	46 1 1 1 1 100% N/A
2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2634 2635 2636 2637 2638 2639 2640	Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects	Genera 46 1 0 N/A N/A N/A N/A (NDs), the	I Statistics	stics and est	Numb Num S	Numl Sher of Di Mai Pe SD of Dete	ber of No stinct No nimum N ximum N ercent No SI ected Lo	on-Detects on-Detect Non-Detect on-Detects D Detected ogged Data	46 1 1 1 1 100% N/A
2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640	Total Number of Observations Number of Distinct Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and	Genera 46 1 0 N/A N/A N/A N/A N/A N/A Other statis	I Statistics refore all statistics are also N	stics and est	Numb Num	Numl her of Di Mai Pe D of Dete	ber of No stinct No nimum No ercent No SI ected Lo be NDs ection lir	on-Detects on-Detect Non-Detect on-Detects D Detected ogged Data	46 1 1 1 1 100% N/A
2623 2624 2625 2626 2627 2628 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642	Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site	Genera 46 1 0 N/A N/A N/A N/A N/A N/A Other statis	I Statistics refore all statistics are also N	stics and est	Numb Num	Numl her of Di Mai Pe D of Dete	ber of No stinct No nimum No ercent No SI ected Lo be NDs ection lir	on-Detects on-Detect Non-Detect on-Detects D Detected ogged Data	46 1 1 1 1 100% N/A
2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643	Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site	Genera 46 1 0 N/A N/A N/A N/A N/A N/A Other statis	I Statistics I statistics refore all statistics are also it alues to estimate the state of the	stics and est	Numb Num Simates should be largered to the lar	Numl her of Di Mai Pe D of Dete	ber of No stinct No nimum No ercent No SI ected Lo be NDs ection lir	on-Detects on-Detect Non-Detect on-Detects D Detected ogged Data	46 1 1 1 1 100% N/A
2623 2624 2625 2626 2627 2628 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643	Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site	Genera 46 1 0 N/A N/A N/A N/A N/A N/A Other statis	I Statistics I statistics refore all statistics are also it alues to estimate the state of the	stics and est	Numb Num Simates should be largered to the lar	Numl her of Di Mai Pe D of Dete	ber of No stinct No nimum No ercent No SI ected Lo be NDs ection lir	on-Detects on-Detect Non-Detect on-Detects D Detected ogged Data	46 1 1 1 1 100% N/A
2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643 2644	Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site	Genera 46 1 0 N/A N/A N/A N/A N/A N/A Other statis	I Statistics I statistics refore all statistics are also it alues to estimate the state of the	stics and est	Numb Num Simates should be largered to the lar	Numl her of Di Mai Pe D of Dete	ber of No stinct No nimum No ercent No SI ected Lo be NDs ection lir	on-Detects on-Detect Non-Detect on-Detects D Detected ogged Data	46 1 1 1 1 100% N/A
2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643 2644 2645 2646	Total Number of Observations Number of Distinct Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative sites The data set for	Genera 46 1 0 N/A N/A N/A N/A N/A N/A Other statis	I Statistics I statistics refore all statistics are also it alues to estimate the state of the	stics and est	Numb Num Simates should be largered to the lar	Numl her of Di Mai Pe D of Dete	ber of No stinct No nimum No ercent No SI ected Lo be NDs ection lir	on-Detects on-Detect Non-Detect on-Detects D Detected ogged Data	46 1 1 1 1 100% N/A
2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2640 2641 2642 2643 2644 2645 2646	Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site The data set for	Genera 46 1 0 N/A N/A N/A N/A N/A N/A Other statis	I Statistics I statistics refore all statistics are also it alues to estimate the state of the	stics and est	Numb Num Simates should be largered to the lar	Numl her of Di Mai Pe D of Dete	ber of No stinct No nimum No ercent No SI ected Lo be NDs ection lir	on-Detects on-Detect Non-Detect on-Detects D Detected ogged Data	46 1 1 1 1 100% N/A
2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643 2644 2645 2644 2645 2646	Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site The data set for	Genera 46 1 0 N/A N/A N/A N/A N/A N/A variable TO	I Statistics I Statistics refore all statistics are also Nalues to estimate the state of the s	stics and est	Numb Num Simates should be largered to the lar	Numl her of Di Mai Pe D of Dete	ber of No stinct No nimum No ercent No SI ected Lo be NDs ection lir	on-Detects on-Detect Non-Detect on-Detects D Detected ogged Data	46 1 1 1 1 100% N/A
2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2640 2641 2642 2643 2644 2645 2646	Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative site The data set for	Genera 46 1 0 N/A N/A N/A N/A N/A N/A variable TO	I Statistics I statistics refore all statistics are also it alues to estimate the state of the	stics and est	Numb Num Simates she low the larental para	Der of Misson Numl Suber of Di Mai Pe SD of Dete	ber of No stinct No nimum N ximum N ercent No SI ected Lc be NDs ection lir (e.g., EF	on-Detects on-Detect Non-Detect on-Detects D Detected ogged Data	46 1 1 1 1 100% N/A

	Α	В	С	D		ΙE	F	G	Н	1 1	J	K	
2651	,,				nct C	Observation		<u> </u>			, ,		_
2652				N	ımbe	er of Detect	s 0				Number	of Non-Detects	47
2653				Number o	Dis	tinct Detect	s 0			Num	ber of Distin	ct Non-Detects	1
2654					Mini	imum Detec	t N/A				Minimu	ım Non-Detect	1
2655					Maxi	imum Detec	t N/A				Maximu	ım Non-Detect	1
2656				V	arian	ice Detecte	d N/A				Percer	nt Non-Detects	100%
					Me	an Detecte	d N/A					SD Detected	N/A
2657 2658			Mea	an of Detec	ted I	Logged Dat	a N/A			SI	D of Detecte	d Logged Data	N/A
2659		Warı	ning: All ob	servations	are	Non-Detec	s (NDs), ther	efore all stati	stics and es	timates sho	ould also be	NDs!	
2660			_				d other statis						
2661	-	•	•				te specific va				•		
2662							<u> </u>			•		· · ·	
2663				The dat	a set	for variable	1,1,1-TRICH	ILOROETHA	NE was not	processed	!		
2664										•			
2665													
2666	TRICHLOR	OETHENE											
2007													
2668							General	Statistics					
2669			Tot	tal Numbe	of C	Observation				Numb	er of Missino	Observations	0
2670			Numb	per of Disti	nct C	Observation	s 1					<u></u>	
2671				N ₁	ımbe	er of Detect	s 0				Number o	of Non-Detects	47
2672				Number o	Dis	tinct Detect	s 0			Num	ber of Disting	ct Non-Detects	1
2673						imum Detec						ım Non-Detect	
2674						imum Detec						ım Non-Detect	
2675						ice Detecte						nt Non-Detects	100%
2676						an Detecte					1 01001	SD Detected	N/A
2677			Mea	n of Deter		Logged Dat				SI	D of Detecte	d Logged Data	
2678							4 1071						1071
2679		Warı	nina: All ob	servations	are	Non-Detec	s (NDs), ther	efore all stati	stics and es	timates sho	ould also be	NDs!	
2680			•				d other statis						
2681	-	•	•	•							•	, EPC, BTV).	
2682							•			•			
2683				The	data	set for varia	ble TRICHLO	DROETHENI	E was not pr	ocessed!			
2684									•				
2685													
2686 2687	VINYL CHL	.ORIDE											
2007													
2688							General	Statistics					
2689			Tot	tal Numbe	of C	Observation				Numb	er of Missino	Observations	0
2690			Numb	per of Disti	nct C	Observation	s 1						
2691						er of Detect					Number	of Non-Detects	47
2692						tinct Detect				Num		ct Non-Detects	
2693						imum Detec						ım Non-Detect	
2694						imum Detec						ım Non-Detect	
2695						ice Detecte						nt Non-Detects	100%
2696						an Detecte						SD Detected	N/A
2697			Mea	an of Deter		Logged Dat				SI	D of Detecte	d Logged Data	
2698											2. 2 3.00.0		
2699		Warı	ning: All oh	servations	are	Non-Detec	s (NDs), ther	efore all stati	stics and es	timates sho	ould also he l	NDs!	
2700		vvdII	iiiig. All Ub	Joi valions	aie	יאסוו-טפופט	o (1100), 11101	orore an sidi	onco anu 65	umates sill	raiu aisu be	100:	

	Α	В	С	D	Е	F	G	Н	I	J	K	L
2701		Specific	ally, sample	mean, UCLs,	UPLs, and	other statist	ics are also N	NDs lying bel	low the large	st detection I	imit!	
2702	Т	he Project To	eam may ded	cide to use alt	ernative site	e specific val	ues to estim	ate environm	nental param	eters (e.g., E	PC, BTV).	
2703												
2704				The data	set for vari	able VINYL (CHLORIDE v	was not proce	essed!			
2705												
2706												
2707	XYLENES (TOTAL)										
2708												
2709						General	Statistics					
2710				Number of Ol		47			Number	of Missing C	bservations	0
2711			Number	of Distinct Ob		1						
2712					of Detects	0				Number of I		
2713			Nu	ımber of Disti		0			Numbe	er of Distinct N		
2714					num Detect					Minimum	Non-Detect	
2715					num Detect	N/A					Non-Detect	
2716					e Detected	N/A					Non-Detects	
2717					n Detected	N/A					SD Detected	
2718			Mean	of Detected Lo	ogged Data	N/A			SD	of Detected L	ogged Data	N/A
2719												
2720			•	rvations are N		* *						
2721		•	•	mean, UCLs,	•				•			
2722	Т	he Project To	eam may ded	cide to use alt	ernative site	e specific val	ues to estim	ate environm	nental param	eters (e.g., E	PC, BTV).	
2723												
2724				The data	set for varia	able XYLENE	ES (TOTAL)	was not proc	essed!			
2725												
2726												



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 10/08/2020
DEP USE ONLY

FORM 52 MUNICIPAL WASTE LANDFILL PRIVATE WATER SUPPLY QUARTERLY WATER QUALITY ANALYSES

General Reference: Act 101 Section 1103			
SECTION A. SITE IDENTIFIER			
Applicant/permittee:	ancaster County Solid Waste Manage		
Site Name: F	rey Farm Landfill		
Facility ID (as issued by DEP): 101389			
SECTION B. PRIVATE WATER SUPPLY INFORMATION			
INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")			
Facility Name: Frey Farm L	andfill		
County: Lancaster C	ounty		
Township or Municipality: MANOR TO	WNSHIP		
Landowner Name:LCSWMA			
Address: 3044 RIVEF	ROAD		
Phone No.:			
Sampling Point: Latitude: 39 o	57 ' 30.58 " Longitude: 76 ° 26 ' 11.25 "		
Depth to Water Level:	ft. Measured from: X Land Surface TOC		
Casing Stick Up:	ft. Elevation of Water Level: ft./MSL		
Total Well Depth:	ft.		
Sampling Depth:	ft. Sampling Method: Pumped Bailed		
Well Purged: Yes	X No Well Volumes Purged:		
Sample Field Filtered (must be 0.45 micro	on)?: X Yes No		
Sample Date:(mm/dd/yy) 08/2	1/2020 Sample Collection Time: 11:00 AM		
Laboratory(ies) Performing Analysis	ALS Environmental		
(include address and phone number)	34 Dogwood Lane		
	Middletown, PA 17057 (717) 944-5541		
Lab Accreditation Number(s)	22-293		
Lab Analysis Date	09/09/2020		
Were any holding times exceeded?:	Yes X No If yes, please explain in comments field.		
Comments:			

Facility I.D. Number

Monitoring Point I.D. No.

PS LCSWMA

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	6	SM20-2321
CALCIUM, TOTAL	13.4	EPA 200.7
CALCIUM, DISSOLVED	13.7	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	20.8	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	10.7	EPA 200.7
MAGNESIUM, DISSOLVED	10.8	EPA 200.7
MANGANESE, TOTAL (ug/l)	30	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	29	EPA 200.7
NITRATE-NITROGEN	18.3	EPA 300

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number

101389

Monitoring Point I.D. No.

PS LCSWMA

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	4.86	FIELD
pH-LAB (SU)	5.61	SM4500B
POTASSIUM, TOTAL	1.9	EPA 200.7
POTASSIUM, DISSOLVED	1.7	EPA 200.7
SODIUM, TOTAL	8.9	EPA 200.7
SODIUM, DISSOLVED	9.1	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	282	FIELD
SPEC. COND., LAB (umhos/cm)	230	EPA 120.1
SULFATE	2 ND	EPA 300
ALKALINITY	6	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	180	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5	EPA 420.4
TURBIDITY (NTU)	0.1 ND	SM 2130B

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number

101389

Monitoring Point I.D. No.

PS LCSWMA

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 10/08/2020
DEP USE ONLY

FORM 52 MUNICIPAL WASTE LANDFILL PRIVATE WATER SUPPLY QUARTERLY WATER QUALITY ANALYSES

General Reference: Act 101 Section 1103			
SECTION A. SITE IDENTIFIER			
Applicant/permittee:	ancaster County Solid Waste Manage		
Site Name: F	rey Farm Landfill		
Facility ID (as issued by DEP): 101389			
SECTION B. PRIVATE WATER SUPPLY INFORMATION			
INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")			
Facility Name: Frey Farm L	andfill		
County: Lancaster C	ounty		
Township or Municipality: MANOR TO	WNSHIP		
Landowner Name:MILLER			
Address: 3052 RIVEF	ROAD		
Phone No.:			
Sampling Point: Latitude: 39 o	57 ' 29.85 " Longitude: 76 ° 26 ' 11.45 "		
Depth to Water Level:	ft. Measured from: X Land Surface TOC		
Casing Stick Up:	ft. Elevation of Water Level: ft./MSL		
Total Well Depth:	ft.		
Sampling Depth:	ft. Sampling Method: Pumped Bailed		
Well Purged: Yes	X No Well Volumes Purged:		
Sample Field Filtered (must be 0.45 micro	on)?: X Yes No		
Sample Date:(mm/dd/yy) 08/2	1/2020 Sample Collection Time: 11:18 AM		
Laboratory(ies) Performing Analysis	ALS Environmental		
(include address and phone number)	34 Dogwood Lane		
	Middletown, PA 17057 (717) 944-5541		
Lab Accreditation Number(s)	22-293		
Lab Analysis Date	09/10/2020		
Were any holding times exceeded?:	Yes X No If yes, please explain in comments field.		
Comments:			

Facility I.D. Number
101389

Monitoring Point I.D. No.
PS MILLER

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	6	SM20-2321
CALCIUM, TOTAL	16.4	EPA 200.7
CALCIUM, DISSOLVED	16.6	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	21.2	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	40	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	8.8	EPA 200.7
MAGNESIUM, DISSOLVED	9	EPA 200.7
MANGANESE, TOTAL (ug/l)	37	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	37	EPA 200.7
NITRATE-NITROGEN	17.6	EPA 300

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number 101389

Monitoring Point I.D. No.

PS MILLER

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	4.89	FIELD
pH-LAB (SU)	5.59	SM4500B
POTASSIUM, TOTAL	2	EPA 200.7
POTASSIUM, DISSOLVED	2	EPA 200.7
SODIUM, TOTAL	7.9	EPA 200.7
SODIUM, DISSOLVED	8.2	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	259	FIELD
SPEC. COND., LAB (umhos/cm)	218	EPA 120.1
SULFATE	2.3	EPA 300
ALKALINITY	6	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	170	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5	EPA 420.4
TURBIDITY (NTU)	0.69	SM 2130B

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number 101389

Monitoring Point I.D. No.

PS MILLER

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 10/08/2020
DEP USE ONLY

FORM 52 MUNICIPAL WASTE LANDFILL PRIVATE WATER SUPPLY QUARTERLY WATER QUALITY ANALYSES

General Reference: Act 101 Section 1103			
SECTION A. SITE IDENTIFIER			
Applicant/permittee:	ancaster County Solid Waste Manage		
Site Name: F	rey Farm Landfill		
Facility ID (as issued by DEP): 101389			
SECTION B. PRIVATE WATER SUPPLY INFORMATION			
INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")			
Facility Name: Frey Farm L	andfill		
County: Lancaster C	ounty		
Township or Municipality: MANOR TO	WNSHIP		
Landowner Name:LCSWMA			
Address: 3056 RIVEF	ROAD		
Phone No.:			
Sampling Point: Latitude: 39 o	57 ' 28.44 " Longitude: 76 ° 26 ' 10.43 "		
Depth to Water Level:	ft. Measured from: X Land Surface TOC		
Casing Stick Up:	ft. Elevation of Water Level: ft./MSL		
Total Well Depth:	ft.		
Sampling Depth:	ft. Sampling Method: Pumped Bailed		
Well Purged: Yes	X No Well Volumes Purged:		
Sample Field Filtered (must be 0.45 micro	on)?: X Yes No		
Sample Date:(mm/dd/yy) 08/2	1/2020 Sample Collection Time: 11:29 AM		
Laboratory(ies) Performing Analysis	ALS Environmental		
(include address and phone number)	34 Dogwood Lane		
	Middletown, PA 17057 (717) 944-5541		
Lab Accreditation Number(s)	22-293		
Lab Analysis Date	09/10/2020		
Were any holding times exceeded?:	Yes X No If yes, please explain in comments field.		
Comments:			

Facility I.D. Number 101389

Monitoring Point I.D. No.

PS LCSWMA

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	5 ND	SM20-2321
CALCIUM, TOTAL	11.5	EPA 200.7
CALCIUM, DISSOLVED	11.6	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	26.7	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	13.6	EPA 200.7
MAGNESIUM, DISSOLVED	13.7	EPA 200.7
MANGANESE, TOTAL (ug/l)	100	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	100	EPA 200.7
NITRATE-NITROGEN	22.6	EPA 300

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number

101389

Monitoring Point I.D. No.

PS LCSWMA

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	3.74	FIELD
pH-LAB (SU)	4.03	SM4500B
POTASSIUM, TOTAL	2.5	EPA 200.7
POTASSIUM, DISSOLVED	2.3	EPA 200.7
SODIUM, TOTAL	8.9	EPA 200.7
SODIUM, DISSOLVED	9.2	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	322	FIELD
SPEC. COND., LAB (umhos/cm)	277	EPA 120.1
SULFATE	2 ND	EPA 300
ALKALINITY	5 ND	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	202	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.14	SM 2130B

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number

101389

Monitoring Point I.D. No.

PS LCSWMA

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

	Date Prepared/Revised 10/08/2020
DEP USE ONLY	

FORM 52 MUNICIPAL WASTE LANDFILL PRIVATE WATER SUPPLY QUARTERLY WATER QUALITY ANALYSES

General Reference: Act 101 Section	1103		
SECTION A. SITE IDENTIFIER			
Applicant/permittee:	ancaster County Solid Waste Manage		
Site Name: F	rey Farm Landfill		
Facility ID (as issued by DEP):	01389		
SEC	TION B. PRIVATE WATER SUPPLY INFORMATION		
INDICATE THE LATITUDE AND LONGIT	UDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")		
Facility Name: Frey Farm L	andfill		
County: Lancaster C	ounty		
Township or Municipality: MANOR TO	WNSHIP		
Landowner Name:LCSWMA			
Address: 3060 RIVER	R ROAD		
Phone No.:			
Sampling Point: Latitude: 39 o	57 ' 27.63 " Longitude: 76 ° 26 ' 10.01 "		
Depth to Water Level:	ft. Measured from: X Land Surface TOC		
Casing Stick Up:	ft. Elevation of Water Level: ft./MSL		
Total Well Depth:	ft.		
Sampling Depth:	ft. Sampling Method: Pumped Bailed		
Well Purged: Yes	X No Well Volumes Purged:		
Sample Field Filtered (must be 0.45 micr			
Sample Date:(mm/dd/yy) 08/2	1/2020 Sample Collection Time: 11:39 AM		
Laboratory(ies) Performing Analysis	ALS Environmental		
(include address and phone number)	34 Dogwood Lane		
	Middletown, PA 17057 (717) 944-5541		
Lab Accreditation Number(s)	22-293		
Lab Analysis Date	09/09/2020		
Were any holding times exceeded?:	Yes X No If yes, please explain in comments field.		
Comments:			

Facility I.D. Number

Monitoring Point I.D. No.

PS LCSWMA

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	5 ND	SM20-2321
CALCIUM, TOTAL	10.8	EPA 200.7
CALCIUM, DISSOLVED	11	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	23	EPA 410.2
CHLORIDE	21	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	11.6	EPA 200.7
MAGNESIUM, DISSOLVED	11.9	EPA 200.7
MANGANESE, TOTAL (ug/l)	110	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	110	EPA 200.7
NITRATE-NITROGEN	16.2	EPA 300

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number

101389

Monitoring Point I.D. No.

PS LCSWMA

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	4.09	FIELD
pH-LAB (SU)	4.54	SM4500B
POTASSIUM, TOTAL	2.7	EPA 200.7
POTASSIUM, DISSOLVED	2.6	EPA 200.7
SODIUM, TOTAL	8.5	EPA 200.7
SODIUM, DISSOLVED	9	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	264	FIELD
SPEC. COND., LAB (umhos/cm)	226	EPA 120.1
SULFATE	9.8	EPA 300
ALKALINITY	5 ND	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	152	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.14	SM 2130B

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number

101389

Monitoring Point I.D. No.

PS LCSWMA

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 10/08/2020
DEP USE ONLY

FORM 52 MUNICIPAL WASTE LANDFILL PRIVATE WATER SUPPLY QUARTERLY WATER QUALITY ANALYSES

General Reference: Act 101 Section	1103		
SECTION A. SITE IDENTIFIER			
Applicant/permittee:	ancaster County Solid Waste Manage		
Site Name: F	rey Farm Landfill		
Facility ID (as issued by DEP): 1	01389		
SEC ⁻	TION B. PRIVATE WATER SUPPLY INFORMATION		
INDICATE THE LATITUDE AND LONGIT	UDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")		
Facility Name: Frey Farm L	andfill		
County: Lancaster C	ounty		
Township or Municipality: MANOR TO	WNSHIP		
Landowner Name: SENSENICH	1		
Address: 3076 RIVEF	ROAD		
Phone No.:			
Sampling Point: Latitude: 39 o	57 ' 28.2 " Longitude: 76 ° 26 ' 11.1 "		
Depth to Water Level:	ft. Measured from: X Land Surface TOC		
Casing Stick Up:	ft. Elevation of Water Level: ft./MSL		
Total Well Depth:			
Sampling Depth:	ft. Sampling Method: Pumped Bailed		
Well Purged: Yes	X No Well Volumes Purged:		
Sample Field Filtered (must be 0.45 micro	on)?: X Yes No		
Sample Date:(mm/dd/yy) 08/21/2020 Sample Collection Time: 12:00 PM			
Laboratory(ies) Performing Analysis	ALS Environmental		
(include address and phone number)	34 Dogwood Lane		
	Middletown, PA 17057 (717) 944-5541		
Lab Accreditation Number(s)	22-293		
Lab Analysis Date	09/09/2020		
Were any holding times exceeded?:	Yes X No If yes, please explain in comments field.		
Comments:			

Facility I.D. Number 101389

Monitoring Point I.D. No.

PS SENSENICH

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	6	SM20-2321
CALCIUM, TOTAL	14.2	EPA 200.7
CALCIUM, DISSOLVED	14.7	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	22	EPA 410.2
CHLORIDE	48.8	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	8.5	EPA 200.7
MAGNESIUM, DISSOLVED	8.9	EPA 200.7
MANGANESE, TOTAL (ug/l)	180	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	180	EPA 200.7
NITRATE-NITROGEN	9.8	EPA 300

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number

101389

Monitoring Point I.D. No.

PS SENSENICH

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	4.9	FIELD
pH-LAB (SU)	5.52	SM4500B
POTASSIUM, TOTAL	3.6	EPA 200.7
POTASSIUM, DISSOLVED	3.5	EPA 200.7
SODIUM, TOTAL	23.8	EPA 200.7
SODIUM, DISSOLVED	25.3	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	328	FIELD
SPEC. COND., LAB (umhos/cm)	284	EPA 120.1
SULFATE	11.1	EPA 300
ALKALINITY	6	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	182	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.23	SM 2130B

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number

101389

Monitoring Point I.D. No.

PS SENSENICH

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 10/08/2020
DEP USE ONLY

FORM 52 MUNICIPAL WASTE LANDFILL PRIVATE WATER SUPPLY QUARTERLY WATER QUALITY ANALYSES

General Reference: Act 101 Section	1103
	SECTION A. SITE IDENTIFIER
Applicant/permittee:	ancaster County Solid Waste Manage
Site Name: F	rey Farm Landfill
Facility ID (as issued by DEP): 1	01389
SEC ⁻	TION B. PRIVATE WATER SUPPLY INFORMATION
INDICATE THE LATITUDE AND LONGIT	UDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")
Facility Name: Frey Farm L	andfill
County: Lancaster C	ounty
Township or Municipality: MANOR TO	WNSHIP
Landowner Name:LCSWMA	
Address: 3079 RIVEF	RROAD
Phone No.:	
Sampling Point: Latitude: 39 o	57 ' 21.99 " Longitude: 76 ° 26 ' 10.58 "
Depth to Water Level:	ft. Measured from: X Land Surface TOC
Casing Stick Up:	ft. Elevation of Water Level: ft./MSL
Total Well Depth:	ft.
Sampling Depth:	ft. Sampling Method: Pumped Bailed
Well Purged: Yes	X No Well Volumes Purged:
Sample Field Filtered (must be 0.45 micro	on)?: X Yes No
Sample Date:(mm/dd/yy) 08/2	1/2020 Sample Collection Time: 3:22 PM
Laboratory(ies) Performing Analysis	ALS Environmental
(include address and phone number)	34 Dogwood Lane
	Middletown, PA 17057 (717) 944-5541
Lab Accreditation Number(s)	22-293
Lab Analysis Date	09/09/2020
Were any holding times exceeded?:	Yes X No If yes, please explain in comments field.
Comments:	

Facility I.D. Number 101389

Monitoring Point I.D. No.

PS LCSWMA

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	32	SM20-2321
CALCIUM, TOTAL	10.3	EPA 200.7
CALCIUM, DISSOLVED	10.5	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	22	EPA 410.2
CHLORIDE	32.7	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	5.6	EPA 200.7
MAGNESIUM, DISSOLVED	5.7	EPA 200.7
MANGANESE, TOTAL (ug/l)	120	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	120	EPA 200.7
NITRATE-NITROGEN	0.2 ND	EPA 300

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number 101389

Monitoring Point I.D. No.

PS LCSWMA

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	5.38	FIELD
pH-LAB (SU)	6.13	SM4500B
POTASSIUM, TOTAL	2.2	EPA 200.7
POTASSIUM, DISSOLVED	2.1	EPA 200.7
SODIUM, TOTAL	14.2	EPA 200.7
SODIUM, DISSOLVED	14.6	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	207	FIELD
SPEC. COND., LAB (umhos/cm)	192	EPA 120.1
SULFATE	10.8	EPA 300
ALKALINITY	32	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	150	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5	EPA 420.4
TURBIDITY (NTU)	0.19	SM 2130B

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number

101389

Monitoring Point I.D. No.

PS LCSWMA

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 10/08/2020
DEP USE ONLY
Date Received

FORM 52 MUNICIPAL WASTE LANDFILL PRIVATE WATER SUPPLY QUARTERLY WATER QUALITY ANALYSES

General Reference: Act 101 Section	1103
	SECTION A. SITE IDENTIFIER
Applicant/permittee:	ancaster County Solid Waste Manage
Site Name: F	rey Farm Landfill
Facility ID (as issued by DEP): 1	01389
SEC.	TION B. PRIVATE WATER SUPPLY INFORMATION
INDICATE THE LATITUDE AND LONGIT	UDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")
Facility Name: Frey Farm L	andfill
County: Lancaster C	ounty
Township or Municipality: MANOR TO	WNSHIP
Landowner Name:WEBER	
Address: 3088 RIVEF	ROAD
Phone No.:	
Sampling Point: Latitude: 39 o	57 ' 21 " Longitude: 76 ° 26 ' 7.1 "
Depth to Water Level:	ft. Measured from: X Land Surface TOC
Casing Stick Up:	ft. Elevation of Water Level: ft./MSL
Total Well Depth:	ft.
Sampling Depth:	ft. Sampling Method: Pumped Bailed
Well Purged: Yes	X No Well Volumes Purged:
Sample Field Filtered (must be 0.45 micro	on)?: X Yes No
Sample Date:(mm/dd/yy) 08/2	1/2020 Sample Collection Time: 12:10 PM
Laboratory(ies) Performing Analysis	ALS Environmental
(include address and phone number)	34 Dogwood Lane
	Middletown, PA 17057 (717) 944-5541
Lab Accreditation Number(s)	22-293
Lab Analysis Date	09/09/2020
Were any holding times exceeded?:	Yes X No If yes, please explain in comments field.
Comments:	

Facility I.D. Number
101389

Monitoring Point I.D. No.

PS WEBER

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	168	SM20-2321
CALCIUM, TOTAL	0.16	EPA 200.7
CALCIUM, DISSOLVED	0.14	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	22	EPA 410.2
CHLORIDE	222	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	0.055	EPA 200.7
MAGNESIUM, DISSOLVED	0.1 ND	EPA 200.7
MANGANESE, TOTAL (ug/l)	2.5 ND	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	5 ND	EPA 200.7
NITRATE-NITROGEN	5.7	EPA 300

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number 101389

Monitoring Point I.D. No.

PS WEBER

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.33	FIELD
pH-LAB (SU)	6.94	SM4500B
POTASSIUM, TOTAL	3.1	EPA 200.7
POTASSIUM, DISSOLVED	2.8	EPA 200.7
SODIUM, TOTAL	209	EPA 200.7
SODIUM, DISSOLVED	226	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	328	FIELD
SPEC. COND., LAB (umhos/cm)	1010	EPA 120.1
SULFATE	8.4	EPA 300
ALKALINITY	168	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	522	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	6	EPA 420.4
TURBIDITY (NTU)	0.23	SM 2130B

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number 101389

Monitoring Point I.D. No.

PS WEBER

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 10/08/2020
DEP USE ONLY

FORM 52 MUNICIPAL WASTE LANDFILL PRIVATE WATER SUPPLY QUARTERLY WATER QUALITY ANALYSES

General Reference: Act 101 Section 1103		
	SECTION A. SITE IDENTIFIER	
Applicant/permittee:	ancaster County Solid Waste Manage	
Site Name: F	rey Farm Landfill	
Facility ID (as issued by DEP):	01389	
SEC	TION B. PRIVATE WATER SUPPLY INFORMATION	
INDICATE THE LATITUDE AND LONGIT	UDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")	
Facility Name: Frey Farm L	andfill	
County: Lancaster C	ounty	
Township or Municipality: MANOR TO	WNSHIP	
Landowner Name: KIRCHNER		
Address: 3100 RIVER	R ROAD	
Phone No.:		
Sampling Point: Latitude: 39 o	57 17.9 Longitude: 76 26 6.28 "	
Depth to Water Level:	ft. Measured from: X Land Surface TOC	
Casing Stick Up:	ft. Elevation of Water Level: ft./MSL	
Total Well Depth:	ft.	
Sampling Depth:	ft. Sampling Method: Pumped Bailed	
Well Purged: Yes	X No Well Volumes Purged:	
Sample Field Filtered (must be 0.45 micr		
Sample Date:(mm/dd/yy) 08/2	1/2020 Sample Collection Time: 12:25 PM	
Laboratory(ies) Performing Analysis	ALS Environmental	
(include address and phone number)	34 Dogwood Lane	
	Middletown, PA 17057 (717) 944-5541	
Lab Accreditation Number(s)	22-293	
Lab Analysis Date	09/09/2020	
Were any holding times exceeded?: Yes X No If yes, please explain in comments field.		
Comments:		

Facility I.D. Number 101389

Monitoring Point I.D. No.

PS KIRCHNER

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	11	SM20-2321
CALCIUM, TOTAL	14	EPA 200.7
CALCIUM, DISSOLVED	14.5	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	23	EPA 410.2
CHLORIDE	41.8	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	6.2	EPA 200.7
MAGNESIUM, DISSOLVED	6.4	EPA 200.7
MANGANESE, TOTAL (ug/l)	8.1	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	8.2	EPA 200.7
NITRATE-NITROGEN	4.7	EPA 300

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number

101389

Monitoring Point I.D. No.

PS KIRCHNER

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	5.09	FIELD
pH-LAB (SU)	5.64	SM4500B
POTASSIUM, TOTAL	1.6	EPA 200.7
POTASSIUM, DISSOLVED	1.6	EPA 200.7
SODIUM, TOTAL	16.2	EPA 200.7
SODIUM, DISSOLVED	16.9	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	259	FIELD
SPEC. COND., LAB (umhos/cm)	216	EPA 120.1
SULFATE	8.7	EPA 300
ALKALINITY	11	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	162	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5	EPA 420.4
TURBIDITY (NTU)	0.15	SM 2130B

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number

101389

Monitoring Point I.D. No.

PS KIRCHNER

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

	Date Prepared/Revised 10/08/2020	
DEP USE ONLY		
	Date Received	

FORM 52 MUNICIPAL WASTE LANDFILL PRIVATE WATER SUPPLY QUARTERLY WATER QUALITY ANALYSES

General Reference: Act 101 Section	1103		
	SECTION A. SITE IDENTIFIER		
Applicant/permittee:	E: Lancaster County Solid Waste Manage		
Site Name: F	rey Farm Landfill		
Facility ID (as issued by DEP): 1	01389		
SEC.	TION B. PRIVATE WATER SUPPLY INFORMATION		
INDICATE THE LATITUDE AND LONGIT	UDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")		
Facility Name: Frey Farm L	andfill		
County: Lancaster C	ounty		
Township or Municipality: MANOR TO	WNSHIP		
Landowner Name: FRY			
Address: 3106 RIVEF	ROAD		
Phone No.:			
Sampling Point: Latitude: 39 o	57 ' 17.27 " Longitude: 76 ° 26 ' 5.6 "		
Depth to Water Level:	ft. Measured from: X Land Surface TOC		
Casing Stick Up:	ft. Elevation of Water Level: ft./MSL		
Total Well Depth:	ft.		
Sampling Depth:	ft. Sampling Method: Pumped Bailed		
Well Purged: Yes	X No Well Volumes Purged:		
Sample Field Filtered (must be 0.45 micro	on)?: X Yes No		
Sample Date:(mm/dd/yy) 08/2	1/2020 Sample Collection Time: 12:36 PM		
Laboratory(ies) Performing Analysis	ALS Environmental		
(include address and phone number)	34 Dogwood Lane		
	Middletown, PA 17057 (717) 944-5541		
Lab Accreditation Number(s)	22-293		
Lab Analysis Date	09/09/2020		
Were any holding times exceeded?: Yes X No If yes, please explain in comments field.			
Comments:			

Facility I.D. Number

101389

Monitoring Point I.D. No.

PS FRY

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	12	SM20-2321
CALCIUM, TOTAL	21.4	EPA 200.7
CALCIUM, DISSOLVED	22.2	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	24	EPA 410.2
CHLORIDE	109	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	52	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	14.6	EPA 200.7
MAGNESIUM, DISSOLVED	14.9	EPA 200.7
MANGANESE, TOTAL (ug/l)	44	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	45	EPA 200.7
NITRATE-NITROGEN	10.8	EPA 300

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number 101389

Monitoring Point I.D. No.

PS FRY

Sample Date

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	5.24	FIELD
pH-LAB (SU)	6.04	SM4500B
POTASSIUM, TOTAL	2.3	EPA 200.7
POTASSIUM, DISSOLVED	2.3	EPA 200.7
SODIUM, TOTAL	43.4	EPA 200.7
SODIUM, DISSOLVED	46.2	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	452	FIELD
SPEC. COND., LAB (umhos/cm)	469	EPA 120.1
SULFATE	5.6	EPA 300
ALKALINITY	12	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	296	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.29	SM 2130B

T Please indicate detection limit if analyte is not detected.

Facility I.D. Number	
101389	
Monitoring Point I.D. No.	

Sample Date

FRY

PS

08/21/2020

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 10/08/2020
DEP USE ONLY

FORM 52 MUNICIPAL WASTE LANDFILL PRIVATE WATER SUPPLY QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Act 101 Section	1103
	SECTION A. SITE IDENTIFIER
Applicant/permittee:	ancaster County Solid Waste Manage
Site Name: F	rey Farm Landfill
Facility ID (as issued by DEP): 1	01389
SEC ⁻	TION B. PRIVATE WATER SUPPLY INFORMATION
INDICATE THE LATITUDE AND LONGIT	UDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")
Facility Name: Frey Farm L	andfill
County: Lancaster C	ounty
Township or Municipality: MANOR TO	WNSHIP
Landowner Name:BECK	
Address: 3125 RIVEF	ROAD
Phone No.:	
Sampling Point: Latitude: 39 o	57 ' 11.6 " Longitude: 76 ° 26 ' 5.4 "
Depth to Water Level:	ft. Measured from: X Land Surface TOC
Casing Stick Up:	ft. Elevation of Water Level: ft./MSL
Total Well Depth:	ft.
Sampling Depth:	ft. Sampling Method: Pumped Bailed
Well Purged: Yes	X No Well Volumes Purged:
Sample Field Filtered (must be 0.45 micro	on)?: X Yes No
Sample Date:(mm/dd/yy) 08/2	1/2020 Sample Collection Time: 1:00 PM
Laboratory(ies) Performing Analysis	ALS Environmental
(include address and phone number)	34 Dogwood Lane
	Middletown, PA 17057 (717) 944-5541
Lab Accreditation Number(s)	22-293
Lab Analysis Date	09/09/2020
Were any holding times exceeded?:	Yes X No If yes, please explain in comments field.
Comments:	

FORM 52 MUNICIPAL WASTE LANDFILL PRIVATE WATER SUPPLY QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number
101389

Monitoring Point I.D. No.
PS BECK

Sample Date

08/21/2020

1. Inorganics (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	124	SM20-2321
CALCIUM, TOTAL	0.3	EPA 200.7
CALCIUM, DISSOLVED	0.28	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	21	EPA 410.2
CHLORIDE	85	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	0.056	EPA 200.7
MAGNESIUM, DISSOLVED	0.1 ND	EPA 200.7
MANGANESE, TOTAL (ug/l)	2.5 ND	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	5 ND	EPA 200.7
NITRATE-NITROGEN	4.7	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52 MUNICIPAL WASTE LANDFILL PRIVATE WATER SUPPLY QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number 101389

Monitoring Point I.D. No.

PS BECK

Sample Date

08/21/2020

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.16	FIELD
pH-LAB (SU)	6.89	SM4500B
POTASSIUM, TOTAL	2.3	EPA 200.7
POTASSIUM, DISSOLVED	2	EPA 200.7
SODIUM, TOTAL	120	EPA 200.7
SODIUM, DISSOLVED	125	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	554	FIELD
SPEC. COND., LAB (umhos/cm)	563	EPA 120.1
SULFATE	9.8	EPA 300
ALKALINITY	124	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	300	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.61	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.16	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52 MUNICIPAL WASTE LANDFILL PRIVATE WATER SUPPLY QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number 101389

Monitoring Point I.D. No.

PS BECK

Sample Date

08/21/2020

2. Organics (Enter all data in ug/l)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.





NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

September 10, 2020

Mr. Daniel Brown Lancaster County Solid Waste Authority 1299 Hbg Pike, P.O. Box 4425 Lancaster, PA 17604

Certificate of Analysis

Project Name: CONTIGUOUS LANDOWNER- Workorder: 3123274

3044 RIVER RD

Purchase Order: PO1000126 Workorder ID: 3RD QTR 2020-3044 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 21, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki, Ms. Jordan Gallagher, Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America

Report ID: 3123274 - 9/10/2020 Page 1 of 9





NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3123274 3RD QTR 2020-3044 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3123274001	3044 River Road, Conestoga, PA	Water	8/21/2020 11:00	8/21/2020 17:30	Mr. Brian G Shade

Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

Report ID: 3123274 - 9/10/2020 Page 2 of 9





NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3123274 3RD QTR 2020-3044 RIVER RD

Notes

- -- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.
- -- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- -- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- -- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- -- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- -- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

- J Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
- U Indicates that the analyte was Not Detected (ND)
- N Indicates presumptive evidence of the presence of a compound
- MDL Method Detection Limit
 PQL Practical Quantitation Li
- PQL Practical Quantitation Limit
- RDL Reporting Detection Limit
- ND Not Detected indicates that the analyte was Not Detected at the RDL
- Cntr Analysis was performed using this container
- RegLmt Regulatory Limit
- LCS Laboratory Control Sample
- MS Matrix Spike
- MSD Matrix Spike Duplicate
- DUP Sample Duplicate
- %Rec Percent Recovery
- RPD Relative Percent Difference
- LOD DoD Limit of Detection
 LOQ DoD Limit of Quantitation
- DL DoD Detection Limit
 - I Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
- (S) Surrogate Compound
- NC Not Calculated
- * Result outside of QC limits

Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

Report ID: 3123274 - 9/10/2020 Page 3 of 9





NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3123274 3RD QTR 2020-3044 RIVER RD

Lab ID: 312374001 Date Collected: 8/21/2020 11:00 Matrix: Water

Sample ID: 3044 River Road, Conestoga, PA Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS	·		-							
Benzene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/27/20 02:33	PDK	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 02:33	PDK	K
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	Ву	Analyzed	Ву	Cntr
1,2-Dichloroethane-d4 (S)	92.6		%	62 - 133	SW846 8260B			8/27/20 02:33	PDK	K
4-Bromofluorobenzene (S)	102		%	79 - 114	SW846 8260B			8/27/20 02:33	PDK	K
Dibromofluoromethane (S)	92.6		%	78 - 116	SW846 8260B			8/27/20 02:33	PDK	K
Toluene-d8 (S)	101		%	76 - 127	SW846 8260B			8/27/20 02:33	PDK	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	6		mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	С
Alkalinity, Total	6	1	mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	Α
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			9/1/20 09:37	JXL	В
Chemical Oxygen Demand (COD)	ND	2	mg/L	15	EPA 410.4			9/9/20 20:00	JAM	В
Chloride	20.8		mg/L	2.0	EPA 300.0			8/22/20 18:00	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/20 18:00	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/26/20 15:25	PAG	1
Nitrate-N	18.3		mg/L	0.20	EPA 300.0			8/22/20 18:00	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/22/20 18:00	MBW	С
рН	5.61	3	pH_Units		S4500HB-11			8/25/20 20:33	R2B	С
Phenolics	0.005		mg/L	0.005	EPA 420.4	8/26/20 06:54	C_D	8/26/20 10:35	VXF	Н
Specific Conductance	230		umhos/cm	1	SM2510B-2011		_	8/25/20 20:33	R2B	С
Sulfate	ND		mg/L	2.0	EPA 300.0			8/22/20 18:00	MBW	-
			9, =	0				5,22,20 10.00		-

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3123274 3RD QTR 2020-3044 RIVER RD

Lab ID: 312374001 Date Collected: 8/21/2020 11:00 Matrix: Water

Sample ID: 3044 River Road, Conestoga, PA Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
Total Dissolved Solids	180		mg/L	25	S2540C-11			8/26/20 11:06	KXH	С
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/26/20 04:52	PAG	F
Turbidity	ND		NTU	0.10	SM2130B-2011			8/22/20 07:43	R2B	С
METALS										
Calcium, Total	13.4		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:12	SRT	D
Calcium, Dissolved	13.7		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:25	SRT	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:12	SRT	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:25	SRT	Е
Magnesium, Total	10.7		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:12	SRT	D
Magnesium, Dissolved	10.8		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:25	SRT	E
Manganese, Total	0.030		mg/L	0.0025	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:12	SRT	D
Manganese, Dissolved	0.029		mg/L	0.0050	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:25	SRT	E
Potassium, Total	1.9		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:12	SRT	D
Potassium, Dissolved	1.7		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:25	SRT	Е
Sodium, Total	8.9		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:12	SRT	D
Sodium, Dissolved	9.1		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:25	SRT	Ε
FIELD PARAMETERS										
pH, Field (SM4500B)	4.86		pH_Units		Field			8/21/20 11:00	BGS	Ν
Specific Conductance, Field	282		umhos/cm	1	Field			8/21/20 11:00	BGS	Ν
Temperature	19.70		Deg. C		Field			8/21/20 11:00	BGS	Ν

Ms. Susan J Scherer Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3123274 3RD QTR 2020-3044 RIVER RD

Lab ID	#	Sample ID	Analytical Method	Analyte
3123274001	1	3044 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity	is titrate	ed to a pH of 4.5 and reported as mg (CaCO3/L.	
3123274001	2	3044 River Road, Conestoga, PA	EPA 410.4	Chemical Oxygen Demand (COD)
		O for method EPA 410.4 was outside to 112 and the control limits were 90 to 112.	he control limits for the analyte Chemi 110.	cal Oxygen Demand (COD). The %
3123274001	3	3044 River Road, Conestoga, PA	S4500HB-11	pH

The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3123274 3RD QTR 2020-3044 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3123274001	3044 River Road, Conestoga, PA	ASTM D6919-09		
3123274001	3044 River Road, Conestoga, PA	EPA 200.7	EPA ACID	
3123274001	3044 River Road, Conestoga, PA	EPA 200.7	EPA TRMD	
3123274001	3044 River Road, Conestoga, PA	EPA 300.0		
3123274001	3044 River Road, Conestoga, PA	EPA 410.4		
3123274001	3044 River Road, Conestoga, PA	EPA 420.4	420.4/9066	
3123274001	3044 River Road, Conestoga, PA	Field		
3123274001	3044 River Road, Conestoga, PA	S2540C-11		
3123274001	3044 River Road, Conestoga, PA	S4500HB-11		
3123274001	3044 River Road, Conestoga, PA	SM2130B-2011		
3123274001	3044 River Road, Conestoga, PA	SM2320B-2011		
3123274001	3044 River Road, Conestoga, PA	SM2510B-2011		
3123274001	3044 River Road, Conestoga, PA	SM5310B-2011		
3123274001	3044 River Road, Conestoga, PA	SW846 8260B		
3123274001	3044 River Road, Conestoga, PA	SW846 9020B		

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<	Q			0	HAIN	CHAIN OF CUSTODY/	STO	/	ð	Generated by ALS	s			-
(ALS) Environmental	D		10	RE	OUES	REQUEST FOR ANALYSIS	ANAL	VSIS						8
Edgesoluse - motores, no 1907 - News, Filstackin - Ser 713 february - most drythalme 301 Fulling Mill Road - Middelsown, PA 17057 - 717 944,5541 + Fex. 717 944,1430	4.5541 + Fax: 717.944.14		ALL ON	SAMP	LER. IN	SAMPLER. INSTRUCTIONS ON THE BACK	ONSON	THE BA(# X	. I				-
Client Name: Lancaster County Solid Waste MA	IA	Container	AG	AN	¥	ខ	_	చ	4	ದೆ	2	ה נ	* * * * * * * * * * * * * * * * * * * *	y Receiving Lab)
Address: 1299 Harrisburg Pike, P.O. Box 4424		Container	40 ml	125 ml	1 250 ml	40 mi	1	250 ml	125 ml	125 ml	500 ml	500 ml Cool	Cooler Temp: Therm ID:	294
Lancaster, PA 17604		Preservative	P	H2S04	H2S04	무	1	H2S04	HNO3	HNO3	None	None No. of	No. of Coolers:	N Initial
Contact: Dan Brown					¥	ANALYSES/METHOD REQUESTED	METHOD	REQUEST	9				Custody Seals Present?	
Phone#: (717) 735-0193		_			_				٠,				(If present) Seals Intact?	
Project Name/#: LCSWMA - Quarterly		_		0					ıM ,	е	.a.,		Received on Ice?	
Bill To: Lancaster County Solid Waste MA									6W (K' N	bos	8	COCiLabels Complete/Accurate?	
TAT Normal-Standard TAT is 10-12 business days.	business days.					s			Ca, Fe	'uW '6)3' Cl'		Cont. in Good Cond.?	
Date Required: Appr	Approved By:					000			:sleta	e, M	S' NC	:03	Correct Sample Volumes?	
						928		doc	ew p	3 'e(ON '	Эн '	Correct Preservation?	
Fax? -Y No.:			-	Н	,	3-948) 'N-) :sle	SQT	Viinil	HeadenaceNolatiles?	
Sample Description/Location	Sample Time	G or C	100	0-0	(OT	TON SWEET IN PROPERTY OF THE P	MH Special	EHN S	K' N	teM g	'Hd		Courier/Tracking #:	
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Project Comments:	(FOGGED B)	LOGGED BY (signature):			Ш			3140	П	swu	s	Standard	Special Processing	State Samples
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Relinquished By Company Name	Date	Time		Rec	eived By	Received By / Company Name	Name	35	Date	Time		USACE	Navy	ž
1 APORTING REW AC	NAW !	1730	2		1	1111	100	Ś	0//12	120	G			<u>2</u>
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C=Grab; C	G=Grab; C=Composite	ALS ENVIRONMENTAL	Air, DW=	SHIPPIN	/ater, GW= G ADDRI	Groundwa ESS: 34 E	er; Ol=Oll; OGWOO	OL=Other D LANE.	MIDDOLE	Sludge; S TOWN, F	0=Soil; W	"Matrix - Al-Alr, DW-Edrikling Water, GW-Groundwater, OI-OI); OL-Other Liquid; SL-Sludge; SO-Soil; WP-Wipe; WW-Wastewater ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057	Vastewater	Rev 8/04



301 Fulling Mill Road Middletown, PA 17057 P: (717) 944-5541 F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWMA Work Order #: 3123274 Initials: DN	Date:	8/11	
Were airbills / tracking numbers present and recorded? Tracking number:	(GNE	YES	NO
2. Are Custody Seals on shipping containers intact?	MONE	YES	NO
3. Are Custody Seals on sample containers intact?		YES	NO
4. Is there a COC (Chain-of-Custody) present?		4E3	NO
5. Are the COC and bottle labels complete, legible and in agreement?			NO
Sa. Does the COC contain sample locations?			NO
Sb. Does the COC contain date and time of sample collection for all samples?		ES.	NO
5c. Does the COC contain sample collectors name?			NO
Sd. Does the COC note the type(s) of preservation for all bottles?			NO
5e. Does the COC note the number of bottles submitted for each sample?			NO
5f. Does the COC note the type of sample, composite or grab?		€\$	NO
Sg. Does the COC note the matrix of the sample(s)?		123	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	E	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(Ez	NO
8. Are all samples within holding times for the requested analyses?			NO.
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)			NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?		YES	NO
11. Were the samples received on ice?	••••••	(E)	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	(NO)
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(E)	NO
13a. Are the samples required for SDWA compliance reporting?		YES	(NO)
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO
Cooler #:		*	
Temperature (°C):			
Thermometer ID: 794	55.55		
Radiological (uCi):	غيميان		

COMMENTS (Required for all NO responses above and any sample non-conformance):

¹Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis

Rev 1/20/2020





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September 11, 2020

Mr. Daniel Brown Lancaster County Solid Waste Authority 1299 Hbg Pike, P.O. Box 4425 Lancaster, PA 17604

Certificate of Analysis

Project Name: CONTIGUOUS LANDOWNER- Workorder:

3052 RIVER RD

Purchase Order: PO1000126 Workorder ID: 3RD QTR 2020-3052 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 21, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki , Ms. Jordan Gallagher , Landowner , Mr. Jeff

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Susan J Scherer Project Coordinator

3123273

ALS Environmental Laboratory Locations Across North America

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3123273 3RD QTR 2020-3052 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3123273001	3052 River Road, Conestoga, PA	Water	8/21/2020 11:18	8/21/2020 17:30	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3123273 3RD QTR 2020-3052 RIVER RD

Notes

- -- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.
- -- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- -- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- -- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- -- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- -- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

- J Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
- U Indicates that the analyte was Not Detected (ND)
- N Indicates presumptive evidence of the presence of a compound
- MDL Method Detection Limit
- PQL Practical Quantitation Limit
- RDL Reporting Detection Limit
- ND Not Detected indicates that the analyte was Not Detected at the RDL
- Cntr Analysis was performed using this container
- RegLmt Regulatory Limit
- LCS Laboratory Control Sample
- MS Matrix Spike
- MSD Matrix Spike Duplicate
- DUP Sample Duplicate
- %Rec Percent Recovery
 RPD Relative Percent Di
- RPD Relative Percent Difference
 LOD DoD Limit of Detection
- LOQ DoD Limit of Quantitation
- DL DoD Detection Limit
- I Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
- (S) Surrogate Compound
- NC Not Calculated
- * Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3123273 3RD QTR 2020-3052 RIVER RD

Lab ID: 3123273001 Date Collected: 8/21/2020 11:18 Matrix: Water

Sample ID: 3052 River Road, Conestoga, PA Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/27/20 02:10	PDK	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 02:10	PDK	K
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	Ву	Analyzed	Ву	Cntr
1,2-Dichloroethane-d4 (S)	92.7		%	62 - 133	SW846 8260B			8/27/20 02:10	PDK	K
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			8/27/20 02:10	PDK	K
Dibromofluoromethane (S)	93.1		%	78 - 116	SW846 8260B			8/27/20 02:10	PDK	K
Toluene-d8 (S)	100		%	76 - 127	SW846 8260B			8/27/20 02:10	PDK	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	6		mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	С
Alkalinity, Total	6	1	mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	Α
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			8/29/20 01:52	JXL	В
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			9/10/20 21:27	JAM	В
Chloride	21.2		mg/L	2.0	EPA 300.0			8/22/20 17:45	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/20 17:45	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/26/20 15:04	PAG	1
Nitrate-N	17.6		mg/L	0.20	EPA 300.0			8/22/20 17:45	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/22/20 17:45	MBW	С
pН	5.59	2	pH_Units		S4500HB-11			8/25/20 20:33	R2B	С
Phenolics	0.005		mg/L	0.005	EPA 420.4	8/26/20 06:53	C_D	8/26/20 10:35	VXF	Н
Specific Conductance	218		umhos/cm	1	SM2510B-2011		_	8/25/20 20:33	R2B	С
Sulfate	2.3		mg/L	2.0	EPA 300.0			8/22/20 17:45	MBW	_
Canaco	2.0		1119/ =	2.0	2171000.0			5,22,20 11.40	. V I 🖰 V V	•

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ANALYTICAL RESULTS

Workorder: 3123273 3RD QTR 2020-3052 RIVER RD

Lab ID: 3123273001 Date Collected: 8/21/2020 11:18 Matrix: Water

Sample ID: 3052 River Road, Conestoga, PA Date Received: 8/21/2020 17:30

Parameters										
raiaiileleis	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
Total Dissolved Solids	170		mg/L	25	S2540C-11			8/26/20 11:06	KXH	С
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/26/20 04:52	PAG	F
Turbidity	0.69		NTU	0.10	SM2130B-2011			8/22/20 07:43	R2B	С
METALS										
Calcium, Total	16.4		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:47	SRT	D
Calcium, Dissolved	16.6		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:21	SRT	E
Iron, Total	0.040		mg/L	0.030	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:47	SRT	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:21	SRT	E
Magnesium, Total	8.8		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:47	SRT	D
Magnesium, Dissolved	9.0		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:21	SRT	E
Manganese, Total	0.037		mg/L	0.0025	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:47	SRT	D
Manganese, Dissolved	0.037		mg/L	0.0050	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:21	SRT	E
Potassium, Total	2.0		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:47	SRT	D
Potassium, Dissolved	2.0		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:21	SRT	Е
Sodium, Total	7.9		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:47	SRT	D
Sodium, Dissolved	8.2		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:21	SRT	Е
FIELD PARAMETERS										
pH, Field (SM4500B)	4.89		pH_Units		Field			8/21/20 11:18	BGS	N
Specific Conductance, Field	259		umhos/cm	1	Field			8/21/20 11:18	BGS	N
Temperature	21.60		Deg. C		Field			8/21/20 11:18	BGS	N

Ms. Susan J Scherer Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3123273 3RD QTR 2020-3052 RIVER RD

PARAMETER QUALIFIER	S
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Lab ID	#	Sample ID	Analytical Method	Analyte
3123273001	1	3052 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity	is titrate	ed to a pH of 4.5 and reported as mg (CaCO3/L.	
3123273001	2	3052 River Road, Conestoga, PA	S4500HB-11	рН

The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3123273 3RD QTR 2020-3052 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3123273001	3052 River Road, Conestoga, PA	ASTM D6919-09		
3123273001	3052 River Road, Conestoga, PA	EPA 200.7	EPA ACID	
3123273001	3052 River Road, Conestoga, PA	EPA 200.7	EPA TRMD	
3123273001	3052 River Road, Conestoga, PA	EPA 300.0		
3123273001	3052 River Road, Conestoga, PA	EPA 410.4		
3123273001	3052 River Road, Conestoga, PA	EPA 420.4	420.4/9066	
3123273001	3052 River Road, Conestoga, PA	Field		
3123273001	3052 River Road, Conestoga, PA	S2540C-11		
3123273001	3052 River Road, Conestoga, PA	S4500HB-11		
3123273001	3052 River Road, Conestoga, PA	SM2130B-2011		
3123273001	3052 River Road, Conestoga, PA	SM2320B-2011		
3123273001	3052 River Road, Conestoga, PA	SM2510B-2011		
3123273001	3052 River Road, Conestoga, PA	SM5310B-2011		
3123273001	3052 River Road, Conestoga, PA	SW846 8260B		
3123273001	3052 River Road, Conestoga, PA	SW846 9020B		

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(ALS) Environmental)		A I			KECCESI FOR ANALTSIS	T AI	MALY		THE CLIENT	111				ь ·
301 Fulling Mill Road + Middletown, PA 17057 + 717.944,5641 + Fax: 717.944,1430	44.5541 + Fex. 717.944.1				PLER.	SAMPLER. INSTRUCTIONS ON THE BACK	CTIONS	NO TH					* *		-
Client Name: LCSWMA - Gerald E. Miller, Sr.		Cortainer	AG	AN	₹	AN O	 9		Я	占	я.	ر		yd bi	d by Receiving Lab)
Address: 3052 River Road		Container	40 ml	125 ml	ml 250 ml	\vdash	40 ml	7	250 ml	125 ml	125 ml	500 ml	500 ml	Cooler Temp: 8 Therm ID:	7 da
Conestoga, PA 17516		Presenative	B HCI	H2SO4	D4 H2SO4		모	1	H2S04	HNO3	HNO3	None	None	No. of Coolers:	N Initial
Contact: Gerald E. Miller, Sr.						ANALYS	ES/MET	HOD RE	ANALYSES/METHOD REQUESTED					Custody Seals Present?	
Phone#: (717) 872-5117			L	_	_	H	H	┝		١,				(If present) Seals Intact?	
Project Name/#: LCSWMA - Quarterly			y 12							nM ,	E	.я.		Received on Ice?	
Bill To: Lancaster County Solid Waste MA			:							6w '	?N '>	≱OS		COC/Labels Complete/Accurate?	
TAT X Normal-Standard TAT is 10-12 business days.	2 business days.		98							.63, Fe	('uW '	3' CI'		Cont. In Good Cond.?	
Date Remitted: Annovad Ru:	Toval and surcharges. Approved By:						204			:sje	6W '6	ON '	£C	Correct Containers?	
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Sample Description/Location	Sample Date Time	O oo O'	001	0-0	- 1	- la	oue de	MH S	EHN E	K' N	steM g			Courier/Tracking #:	
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Project Comments:	1,06GED B	LOGGED BY(signature):					Н	pring		Sect		S:	Standard	d Special Processing	State Samples
	REVIEWED	REVIEWED BY (signature):	÷					-tavo		381		ata rable	CLP-like	□ NSACE □	Collected In
Reling	e Date	Time		Re	ceived B	Received By / Company Name	oany Nai	ne		Date	Time		USACE	Navy	ž
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en .			4		`							Report	Reportable to PADEP?	DEP? Sample Disposal	× A
5			9			8	3		5 T			Yes	П	Lab X	≥
7												PWSID#		Special	
6	Į		9						-			EDDS: 1	EDDS: Format Type-		
G=Grab;	G=Grab, C=Composite	"Matrix - All-Air, DW-Drinking Water; GW-Groundwater; Ol-Oil; OL-Other Liquid; SL-Studge; SO-Soil; W AI S ENVIRONMENTAL SHIPPING ADDRESS: 34 DOCKNOOD LANE MIDDLETOWN DA 17957	Air. DW=	Orinking SHIPPIN	Water; G	W=Groun	dwater; 0	NOON	Other Liv	tuid; SL=	Sludge; S	O=Soil: W	P=Wipe; W	"Matrix - All-Air, DW=Drinking Water; GW=Groundwater; Ol=Oil; OL=Other Liquid; SL=Studge; SO=Soit; WP=Wipe; WW=Wastewater ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANF MIDDLETOWN DA 17057	000



301 Fulling Mill Road Middletown, PA 17057 P: (717) 944-5541

F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWMA Work Order #: 3123273 Initials: DN	Date:	8/11	•	
Were airbills / tracking numbers present and recorded? Tracking number:	ØŅE	YES	NO	
2. Are Custody Seals on shipping containers intact?	MONE	YES	NO	ı
3. Are Custody Seals on sample containers intact?		YES	NO	
4. Is there a COC (Chain-of-Custody) present?		. ¥ES	NO	
5. Are the COC and bottle labels complete, legible and in agreement?			NO	
5a. Does the COC contain sample locations?			NO	
5b. Does the COC contain date and time of sample collection for all samples?			NO	
5c. Does the COC contain sample collectors name?			NO	
5d. Does the COC note the type(s) of preservation for all bottles?			NO	
Se. Does the COC note the number of bottles submitted for each sample?			NO	
5f. Does the COC note the type of sample, composite or grab?			NO	
5g. Does the COC note the matrix of the sample(s)?			NO	
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	Œ	NO	
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		Æs	NO	
8. Are all samples within holding times for the requested analyses?			NO	
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		. YES	NO	
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES.	NO	
11. Were the samples received on ice?		. (B)	NO	
12. Were sample temperatures measured at 0.0-6.0°C.		. YES	NO	
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(E)	NO.	
13a. Are the samples required for SDWA compliance reporting?		YES	NO	
13b. Did the client provide a SDWA PWS ID#?		YES	NO	
	N/A	YES	NO	
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO	
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YEŞ	NO	
Cooler #: Temperature (°C): Thermometer ID: Radiological (µCi):	· Carre			
				_

COMMENTS (Required for all NO responses above and any sample non-conformance):

¹Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis

Rev 1/20/2020





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September 11, 2020

Mr. Daniel Brown Lancaster County Solid Waste Authority 1299 Hbg Pike, P.O. Box 4425 Lancaster, PA 17604

Certificate of Analysis

Project Name: FREY FARM Workorder: 3123272

Purchase Order: PO1000126 Workorder ID: 3RD QTR 2020 3056 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 21, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki, Ms. Jordan Gallagher, Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Susan J Scherer Project Coordinator

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SAMPLE SUMMARY

Workorder: 3123272 3RD QTR 2020 3056 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3123272001	3056RIVERRD	Water	8/21/2020 11:29	8/21/2020 17:30	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3123272 3RD QTR 2020 3056 RIVER RD

Notes

- -- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.
- -- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- -- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- -- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- -- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- -- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

- J Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
- U Indicates that the analyte was Not Detected (ND)
- N Indicates presumptive evidence of the presence of a compound
- MDL Method Detection Limit
- PQL Practical Quantitation Limit
- RDL Reporting Detection Limit
- ND Not Detected indicates that the analyte was Not Detected at the RDL
- Cntr Analysis was performed using this container
- RegLmt Regulatory Limit
- LCS Laboratory Control Sample
- MS Matrix Spike
- MSD Matrix Spike Duplicate
- DUP Sample Duplicate
- %Rec Percent Recovery
- RPD Relative Percent Difference
- LOD DoD Limit of Detection
 LOQ DoD Limit of Quantitation
- DL DoD Detection Limit
 - I Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
- (S) Surrogate Compound
- NC Not Calculated
- * Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3123272 3RD QTR 2020 3056 RIVER RD

Lab ID: 312372001 Date Collected: 8/21/2020 11:29 Matrix: Water

Sample ID: 3056RIVERRD Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/27/20 01:47	PDK	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 01:47	PDK	K
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	Ву	Analyzed	Ву	Cntr
1,2-Dichloroethane-d4 (S)	92.6		%	62 - 133	SW846 8260B			8/27/20 01:47	PDK	K
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			8/27/20 01:47	PDK	K
Dibromofluoromethane (S)	93.4		%	78 - 116	SW846 8260B			8/27/20 01:47	PDK	K
Toluene-d8 (S)	100		%	76 - 127	SW846 8260B			8/27/20 01:47	PDK	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	ND		mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	С
Alkalinity, Total	ND	1	mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	Α
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			8/29/20 09:53	JXL	В
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			9/10/20 21:27	JAM	В
Chloride	26.7		mg/L	2.0	EPA 300.0			8/22/20 17:30	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/20 17:30	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/26/20 13:22	PAG	1
Nitrate-N	22.6	3	mg/L	0.50	EPA 300.0			8/26/20 07:08	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/22/20 17:30	MBW	
Н	4.03	2	pH_Units		S4500HB-11			8/25/20 20:33	R2B	C
Phenolics	ND	_	mg/L	0.005	EPA 420.4	8/26/20 06:53	СЪ	8/26/20 10:35	VXF	Н
Specific Conductance	277		umhos/cm	1	SM2510B-2011	5,25,25 55.00	J_D	8/25/20 20:33	R2B	C
Sulfate	ND		mg/L	2.0	EPA 300.0			8/22/20 17:30	MBW	_
Sullate	אט		mg/L	2.0	EFA 300.0			0/22/20 17:30	IVIDVV	C

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ANALYTICAL RESULTS

Workorder: 3123272 3RD QTR 2020 3056 RIVER RD

Lab ID: 312372001 Date Collected: 8/21/2020 11:29 Matrix: Water

Sample ID: 3056RIVERRD Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
Total Dissolved Solids	202		mg/L	25	S2540C-11			8/26/20 11:06	KXH	С
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/26/20 04:52	PAG	F
Turbidity	0.14		NTU	0.10	SM2130B-2011			8/22/20 07:43	R2B	С
METALS										
Calcium, Total	11.5		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:38	SRT	D
Calcium, Dissolved	11.6		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:18	SRT	Е
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:38	SRT	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:18	SRT	E
Magnesium, Total	13.6		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:38	SRT	D
Magnesium, Dissolved	13.7		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:18	SRT	E
Manganese, Total	0.10		mg/L	0.0025	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:38	SRT	D
Manganese, Dissolved	0.10		mg/L	0.0050	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:18	SRT	E
Potassium, Total	2.5		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:38	SRT	D
Potassium, Dissolved	2.3		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:18	SRT	Е
Sodium, Total	8.9		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:38	SRT	D
Sodium, Dissolved	9.2		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:18	SRT	E
FIELD PARAMETERS										
pH, Field (SM4500B)	3.74		pH_Units		Field			8/21/20 11:29	BGS	N
Specific Conductance, Field	322	1	umhos/cm	1	Field			8/21/20 11:29	BGS	N
Temperature	24.20		Deg. C		Field			8/21/20 11:29	BGS	N

Ms. Susan J Scherer Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3123272 3RD QTR 2020 3056 RIVER RD

PARAMETER QUALI

Lab ID	#	Sample ID	Analytical Method	Analyte		
3123272001	1	3056RIVERRD	SM2320B-2011	Alkalinity, Total		
The Total Alkalinit	I Alkalinity is titrated to a pH of 4.5 and reported		CaCO2/I			

The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.

3123272001 2 3056RIVERRD S4500HB-11 pH

The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

3123272001 3 3056RIVERRD EPA 300.0 Nitrate-N

The sample was originally run within hold time, but required further analysis that exceeded hold time.

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3123272 3RD QTR 2020 3056 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3123272001	3056RIVERRD	ASTM D6919-09		
3123272001	3056RIVERRD	EPA 200.7	EPA ACID	
3123272001	3056RIVERRD	EPA 200.7	EPA TRMD	
3123272001	3056RIVERRD	EPA 300.0		
3123272001	3056RIVERRD	EPA 410.4		
3123272001	3056RIVERRD	EPA 420.4	420.4/9066	
3123272001	3056RIVERRD	Field		
3123272001	3056RIVERRD	S2540C-11		
3123272001	3056RIVERRD	S4500HB-11		
3123272001	3056RIVERRD	SM2130B-2011		
3123272001	3056RIVERRD	SM2320B-2011		
3123272001	3056RIVERRD	SM2510B-2011		
3123272001	3056RIVERRD	SM5310B-2011		
3123272001	3056RIVERRD	SW846 8260B		
3123272001	3056RIVERRD	SW846 9020B		

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State Samples ☐Rental_Equipment Rev 8/04 Collected In ed by Receiving Lab) Initial DPickup OLabor ₹ A È 3 2 052 × Sample/COC Comments Therm ID: Special Processing Sample Disposal e P Special USACE Nawy HeadspaceNolaliles? Custody Seals Present? (if present) Seals Intact? Received on Ice? COC/Labels Complete/Accurate? Cont. in Good Cond.? Correct Containers? Correct Sample Volumes? Correct Preservation? Composite_Sampling ALS Field Services: 0 Courier/Tracking #: "Matrix - Al-Akr, DW=Drinking Water, GW=Groundwater, Ol=Oit, OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater Cooler Temp: No. of Coolers: Dother Reportable to PADEP? Standard CLP-like USACE EDDS: Format Type-500 ml None Alkalinity, HCO3 Yes # QISMd ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057 500 ml Deliverables Tb, SpC None Data PH' 1DS' NOS' NO3' CI' 204' E' Generated by ALS Field Results Belov 125 ml HY03 Time 굽 Metals: Ca, Fe, Mg, Mn, K, Na ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT 125 ml 812112° HN03 K, Na Date പ Dissolved Metals: Ca, Fe, Mg, Mn, ANALYSES/METHOD REQUESTED SAMPLER. INSTRUCTIONS ON THE BACK. Enter Number of Containers Per Sample or H2SO4 REQUEST FOR ANALYSIS 250 ml 굽 инз-и' сор CHAIN OF CUSTODY/ Received By / Company Name W. 12/18 3 40 m 8 8 오 2M846-8260 VOCs 250 ml H2S04 Ā XOT 125 mi H2S04 ₹ HO-O 49 49 AG. 오 100 9 9 8 (EVIÈWED BY (signature): ě Container Matrix. .OGGED BY(signature): Time Container Sze G J 10 9. 821-20 301 Fulling Mill Road • Middletown, PA 17057 • 717,944,5541 • Fax; 717,944,1430 1139 Date Time Rush-Subject to ALS approval and surcharges. X Normal-Standard TAT is 10-12 business days. G=Grab, C=Composite Approved By: 08/21/20 Date Secure and Law and Statement, Pa. 1755 at Phase 717-846 5541 a. Fan, 717-846 1456 a. www.amphaba Client Name: Lancaster County Solid Waste MA Address: 1299 Harrisburg Pike, P.O. Box 4424 Relinquished By / Company Name Bill To: Lancaster County Solid Waste MA Project Name#: LCSWMA - Quarterly Sample Description/Location (as it will appear on the lab report) Lancaster, PA 17604 ALS) Environmental (717) 735-0193 .ĕ Dan Brown 13056RIVERRD **≻** Project Comments: Date Required: Contact: hone#: TAT Email? Fax?



301 Fulling Mill Road Middletown, PA 17057 P: (717) 944-5541

F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWMA Work Order #: 313272 Initials: DN Date:	8/11
1. Were airbills / tracking numbers present and recorded?	YES N
Tracking number:	
2. Are Custody Seals on shipping containers intact?	YES N
3. Are Custody Seals on sample containers intact?	YES N
4. Is there a COC (Chain-of-Custody) present?	¥ES N
5. Are the COC and bottle labels complete, legible and in agreement?	
5a. Does the COC contain sample locations?	(ES) N
5b. Does the COC contain date and time of sample collection for all samples?	YES N
Sc. Does the COC contain sample collectors name?	YES N
5d. Does the COC note the type(s) of preservation for all bottles?	YES N
Se. Does the COC note the number of bottles submitted for each sample?	YES N
5f. Does the COC note the type of sample, composite or grab?	🐼 N
5g. Does the COC note the matrix of the sample(s)?	Y25 N
5. Are all aqueous samples requiring preservation preserved correctly?\(^1\)\	YES NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?	Æ∑ No
8. Are all samples within holding times for the requested analyses?	YES NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)	
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?N/A	Y€S NO
11. Were the samples received on ice?	街 N
12. Were sample temperatures measured at 0.0-6.0°C. 1emp > 6°	YES (NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below	. (YE) NO
13a. Are the samples required for SDWA compliance reporting?	YES (NO
13b. Did the client provide a SDWA PWS ID#?	YES NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9? ' N/A	YES NO
13d. Did the client provide the SDWA sample location ID/Description? N/A	YES NO
1 3e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	YES NO
Cooler #:	
Temperature (°C):	
Thermometer ID: 794	-
Memorite ID. O / 1	_

COMMENTS (Required for all NO responses above and any sample non-conformance):

¹Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis

Rev 1/20/2020





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September 10, 2020

Mr. Daniel Brown Lancaster County Solid Waste Authority 1299 Hbg Pike, P.O. Box 4425 Lancaster, PA 17604

Certificate of Analysis

Project Name: FREY FARM Workorder: 3123271

Purchase Order: PO1000126 Workorder ID: 3RD QTR 2020 3060 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 21, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki, Ms. Jordan Gallagher, Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Susan J Scherer Project Coordinator

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SAMPLE SUMMARY

Workorder: 3123271 3RD QTR 2020 3060 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3123271001	3060RIVERRD	Water	8/21/2020 11:39	8/21/2020 17:30	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3123271 3RD QTR 2020 3060 RIVER RD

Notes

- -- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.
- -- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- -- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- -- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- -- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- -- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

- J Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
- U Indicates that the analyte was Not Detected (ND)
- N Indicates presumptive evidence of the presence of a compound
- MDL Method Detection Limit
- PQL Practical Quantitation Limit
- RDL Reporting Detection Limit
- ND Not Detected indicates that the analyte was Not Detected at the RDL
- Cntr Analysis was performed using this container
- RegLmt Regulatory Limit
- LCS Laboratory Control Sample
- MS Matrix Spike
- MSD Matrix Spike Duplicate
- DUP Sample Duplicate
- %Rec Percent Recovery
- RPD Relative Percent Difference
- LOD DoD Limit of Detection
- LOQ DoD Limit of Quantitation
- DL DoD Detection Limit
- I Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
- (S) Surrogate Compound
- NC Not Calculated
- * Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3123271 3RD QTR 2020 3060 RIVER RD

Lab ID: 3123271001 Date Collected: 8/21/2020 11:39 Matrix: Water

Sample ID: 3060RIVERRD Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/27/20 01:24	PDK	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 01:24	PDK	K
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	Ву	Analyzed	Ву	Cntr
1,2-Dichloroethane-d4 (S)	91.6		%	62 - 133	SW846 8260B			8/27/20 01:24	PDK	K
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			8/27/20 01:24	PDK	K
Dibromofluoromethane (S)	90.8		%	78 - 116	SW846 8260B			8/27/20 01:24	PDK	K
Toluene-d8 (S)	101		%	76 - 127	SW846 8260B			8/27/20 01:24	PDK	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	ND		mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	С
Alkalinity, Total	ND	1	mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	Α
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			8/29/20 02:06	JXL	В
Chemical Oxygen Demand (COD)	23		mg/L	15	EPA 410.4			9/9/20 22:10	JAM	В
Chloride	21.0		mg/L	2.0	EPA 300.0			8/22/20 17:15	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/20 17:15	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/26/20 12:18	PAG	1
Nitrate-N	16.2		mg/L	0.20	EPA 300.0			8/22/20 17:15	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/22/20 17:15	MBW	С
pН	4.54	2	pH_Units		S4500HB-11			8/25/20 20:33	R2B	С
Phenolics	ND		mg/L	0.005	EPA 420.4	8/26/20 06:53	C_D	8/26/20 10:35	VXF	Н
Specific Conductance	226		umhos/cm	1	SM2510B-2011		_	8/25/20 20:33	R2B	С
Sulfate	9.8		mg/L	2.0	EPA 300.0			8/22/20 17:15	MBW	_
Canaco	3.0		111g/ L	2.0	2171000.0			5,22,20 11.10		•

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ANALYTICAL RESULTS

Workorder: 3123271 3RD QTR 2020 3060 RIVER RD

Lab ID: 3123271001 Date Collected: 8/21/2020 11:39 Matrix: Water

Sample ID: 3060RIVERRD Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
Total Dissolved Solids	152		mg/L	25	S2540C-11			8/26/20 11:06	KXH	С
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/26/20 04:52	PAG	F
Turbidity	0.14		NTU	0.10	SM2130B-2011			8/22/20 07:43	R2B	С
METALS										
Calcium, Total	10.8		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:28	SRT	D
Calcium, Dissolved	11.0		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:15	SRT	Е
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:28	SRT	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:15	SRT	E
Magnesium, Total	11.6		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:28	SRT	D
Magnesium, Dissolved	11.9		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:15	SRT	E
Manganese, Total	0.11		mg/L	0.0025	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:28	SRT	D
Manganese, Dissolved	0.11		mg/L	0.0050	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:15	SRT	E
Potassium, Total	2.7		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:28	SRT	D
Potassium, Dissolved	2.6		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:15	SRT	Е
Sodium, Total	8.5		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:28	SRT	D
Sodium, Dissolved	9.0		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:15	SRT	E
FIELD PARAMETERS										
pH, Field (SM4500B)	4.09		pH_Units		Field			8/21/20 11:39	BGS	N
Specific Conductance, Field	264	1	umhos/cm	1	Field			8/21/20 11:39	BGS	N
Temperature	22.60		Deg. C		Field			8/21/20 11:39	BGS	N

Ms. Susan J Scherer Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3123271 3RD QTR 2020 3060 RIVER RD

PARAMETER	QUALIFIERS
------------------	------------

Lab ID	#	Sample ID	Analytical Method	Analyte		
3123271001	1	3060RIVERRD	SM2320B-2011	Alkalinity, Total		
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.						
2122271001	2	2060DI\/EDDD	94500HP 11	n⊔		

The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3123271 3RD QTR 2020 3060 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3123271001	3060RIVERRD	ASTM D6919-09		
3123271001	3060RIVERRD	EPA 200.7	EPA ACID	
3123271001	3060RIVERRD	EPA 200.7	EPA TRMD	
3123271001	3060RIVERRD	EPA 300.0		
3123271001	3060RIVERRD	EPA 410.4		
3123271001	3060RIVERRD	EPA 420.4	420.4/9066	
3123271001	3060RIVERRD	Field		
3123271001	3060RIVERRD	S2540C-11		
3123271001	3060RIVERRD	S4500HB-11		
3123271001	3060RIVERRD	SM2130B-2011		
3123271001	3060RIVERRD	SM2320B-2011		
3123271001	3060RIVERRD	SM2510B-2011		
3123271001	3060RIVERRD	SM5310B-2011		
3123271001	3060RIVERRD	SW846 8260B		
3123271001	3060RIVERRD	SW846 9020B		

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State Samples ORental_Equipment Collected In Rev 8/04 (ed by Receiving Lab) Initial DPickup OLabor ₹ ≩ A 2 3 Sample/COC Comments Therm ID: × Special Processing Sample Disposal Lab USACE Navy Special Headspace/Volatiles? Custody Seals Present? (if present) Seals Intact? Received on Ice? COCILabels Complete/Accurate? Cont. in Good Cond.? Correct Containers? Correct Sample Volumes? Correct Preservation? Composite_Sampling ALS Field Services: Courier/Tracking #: **Mainx - Al=Air; DW=Drinking Water; GW=Groundwater; OI=Oiher Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater Cooler Temp: No. of Coolers: Dother Reportable to PADEP? Standard CLP-like USACE EDDS: Format Type-500 ml None Alkalinity, HCO3 **PWSID**# Yes ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057 500 ml Deliverables None Tb, SpC Data ph. TDS, NO2, NO3, CI, SO4, F, Generated by ALS 125 ml HNO3 Time or Field Results Bel ಷ Metals: Ca, Fe, Mg, Mn, K, Na THE CLIENT 125 ml HN03 K' NS Date 01/10 ನ Dissolved Metals: Ca, Fe, Mg, Mn, ANALYSES/METHOD REQUESTED SAMPLER. INSTRUCTIONS ON THE BACK. H2S04 250 ml REQUEST FOR ANALYSIS ALL SHADED AREAS MUST BE COMPLETED BY Enter Number of Containers Per Sample 굽 NH3-N' COD CHAIN OF CUSTODY/ ı Received By / Company Name ΕW 7 40 m 닺 8 2M846-8260 VOCs H2S04 250 ml ¥ XOT 125 ml H2S04 A HO-0 6 를 등 오 B TOC EVIEWED BY(signature): M Preservative xintsM (33) Container OGGED BY(signature): Time Container Type Size G J 10 D. 301 Fulling Mill Road + Middletown, PA 17057 + 717,944,5541 + Fax; 717,944,1430 87.78 Time 1139 Date Rush-Subject to ALS approval and surcharges. X Normal-Standard TAT is 10-12 business days. * G=Grab; C=Composite Approved By: 08/21/20 Sample 31 Degresol Lara + HELSFeltum, FA 1755 + Phase 212 454-5541 + Fax 212-945-1431 + www.deglidad.com Date 趸 Client Name: Lancaster County Solid Waste MA Address: 1299 Harrisburg Pike, P.O. Box 4424 Relinquished By / Company Name Bill To: Lancaster County Solid Waste MA Project Name#: LCSWMA - Quarterly Sample Description/Location (as it will appear on the lab report) Lancaster, PA 17604 ALS Environmental (717) 735-0193 -Y No.: Dan Brown ₹ 3060RIVERRD Project Comments: Date Required: Phone#: Contact: TAT Email? Fax?



301 Fulling Mill Road Middletown, PA 17057 P: (717) 944-5541

F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWMA Work Order #: 3123 271 Initials: DN	Date: <	8/11	
Were airbills / tracking numbers present and recorded?	(ONE	YES	NO
Tracking number:			- 1
2. Are Custody Seals on shipping containers intact?	MONE	YES	NO
3. Are Custody Seals on sample containers intact?		YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
Sa. Does the COC contain sample locations?		(ES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		ES	NO
5c. Does the COC contain sample collectors name?		VES	NO
Sd. Does the COC note the type(s) of preservation for all bottles?		YES	NO
Se. Does the COC note the number of bottles submitted for each sample?		VE2	NO
5f. Does the COC note the type of sample, composite or grab?		VES	NO
5g. Does the COC note the matrix of the sample(s)?		125	NO
6. Are all aqueous samples requiring preservation preserved correctly?1		Œ	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(Es	NO
8. Are all samples within holding times for the requested analyses?		AER	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		√E S	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?		Y€S	NO
11. Were the samples received on ice?		Œ	NO
12. Were sample temperatures measured at 0.0-6.0°C. 1 emp > 6°		YES	60
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		Œ	NO
13a. Are the samples required for SDWA compliance reporting?		YES	(O)
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO
Cooler #:			
Temperature (°C):			
Thermometer ID: 794			
Radiological (µCi):	cmm.	3	
	7		-

COMMENTS (Required for all NO responses above and any sample non-conformance):

¹Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis

Rev 1/20/2020





NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113, WA C999, MD 128, VA 460157, WV DW 9961-C, WV 343

September 10, 2020

Mr. Daniel Brown Lancaster County Solid Waste Authority 1299 Hbg Pike, P.O. Box 4425 Lancaster, PA 17604

Certificate of Analysis

Project Name: **CONTIGUOUS LANDOWNER-**

3076 RIVER RD

Workorder: 3123270

Purchase Order:

PO1000126

Workorder ID: 3RD QTR 2020-3076 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 21, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki, Ms. Jordan Gallagher, Landowner, Mr. Jeff

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Susan J Scherer **Project Coordinator**

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SAMPLE SUMMARY

Workorder: 3123270 3RD QTR 2020-3076 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3123270001	3076 River Road, Conestoga, PA	Water	8/21/2020 12:00	8/21/2020 17:30	Mr. Brian G Shade

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3123270 3RD QTR 2020-3076 RIVER RD

Notes

- -- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.
- -- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- -- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- -- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- -- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- -- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

- J Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
- U Indicates that the analyte was Not Detected (ND)
- N Indicates presumptive evidence of the presence of a compound
- MDL Method Detection Limit
- PQL Practical Quantitation Limit
- RDL Reporting Detection Limit
- ND Not Detected indicates that the analyte was Not Detected at the RDL
- Cntr Analysis was performed using this container
- RegLmt Regulatory Limit
- LCS Laboratory Control Sample
- MS Matrix Spike
- MSD Matrix Spike Duplicate
- DUP Sample Duplicate
- %Rec Percent Recovery
- RPD Relative Percent Difference
- LOD DoD Limit of Detection
 LOQ DoD Limit of Quantitation
- DL DoD Detection Limit
- Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
- (S) Surrogate Compound
- NC Not Calculated
- * Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3123270 3RD QTR 2020-3076 RIVER RD

Lab ID: 312370001 Date Collected: 8/21/2020 12:00 Matrix: Water

Sample ID: 3076 River Road, Conestoga, PA Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/27/20 01:01	PDK	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 01:01	PDK	K
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	Ву	Analyzed	Ву	Cntr
1,2-Dichloroethane-d4 (S)	91.3		%	62 - 133	SW846 8260B			8/27/20 01:01	PDK	K
4-Bromofluorobenzene (S)	102		%	79 - 114	SW846 8260B			8/27/20 01:01	PDK	K
Dibromofluoromethane (S)	93.3		%	78 - 116	SW846 8260B			8/27/20 01:01	PDK	K
Toluene-d8 (S)	99.5		%	76 - 127	SW846 8260B			8/27/20 01:01	PDK	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	6		mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	С
Alkalinity, Total	6	1	mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	Α
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			8/29/20 10:34	JXL	В
Chemical Oxygen Demand (COD)	22		mg/L	15	EPA 410.4			9/9/20 22:10	JAM	В
Chloride	48.8		mg/L	2.0	EPA 300.0			8/22/20 17:00	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/20 17:00	MBW	С
Halogen, Total Organic (TOX)	20.1		ug/L	20.0	SW846 9020B			8/26/20 11:54	PAG	1
Nitrate-N	9.8		mg/L	0.20	EPA 300.0			8/22/20 17:00	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/22/20 17:00	MBW	С
рН	5.52	2	pH_Units		S4500HB-11			8/25/20 20:33	R2B	С
Phenolics	ND		mg/L	0.005	EPA 420.4	8/26/20 06:53	C_D	8/26/20 10:35	VXF	Н
Specific Conductance	284		umhos/cm	1	SM2510B-2011		_	8/25/20 20:33	R2B	С
Sulfate	11.1		mg/L	2.0	EPA 300.0			8/22/20 17:00	MBW	_
Canato	11.1		mg/L	2.0	LI A 300.0			5,22,20 11.00	ייייי	J

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3123270 3RD QTR 2020-3076 RIVER RD

Lab ID: 312370001 Date Collected: 8/21/2020 12:00 Matrix: Water

Sample ID: 3076 River Road, Conestoga, PA Date Received: 8/21/2020 17:30

	- ·			551			_		_	. .
Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
Total Dissolved Solids	182		mg/L	25	S2540C-11			8/26/20 11:06	KXH	С
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/26/20 04:52	PAG	F
Turbidity	0.23		NTU	0.10	SM2130B-2011			8/22/20 07:43	R2B	С
METALS										
Calcium, Total	14.2		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:09	SRT	D
Calcium, Dissolved	14.7		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:11	SRT	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:09	SRT	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:11	SRT	Е
Magnesium, Total	8.5		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:09	SRT	D
Magnesium, Dissolved	8.9		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:11	SRT	Е
Manganese, Total	0.18		mg/L	0.0025	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:09	SRT	D
Manganese, Dissolved	0.18		mg/L	0.0050	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:11	SRT	Е
Potassium, Total	3.6		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:09	SRT	D
Potassium, Dissolved	3.5		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:11	SRT	Ε
Sodium, Total	23.8		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:09	SRT	D
Sodium, Dissolved	25.3		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:11	SRT	Е
FIELD PARAMETERS										
pH, Field (SM4500B)	4.90	p	H_Units		Field			8/21/20 12:00	BGS	M
Specific Conductance, Field	328	u	mhos/cm	1	Field			8/21/20 12:00	BGS	M
Temperature	20.30		Deg. C		Field			8/21/20 12:00	BGS	M

Ms. Susan J Scherer Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3123270 3RD QTR 2020-3076 RIVER RD

PARAMETER QUALIFIER	IFIERS	AL	QU	ΓER	MET	Αľ	R	Α	P
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Lab ID	#	Sample ID	Analytical Method	Analyte				
3123270001	1	3076 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total				
The Total Alkalinity	The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.							
3123270001	2	3076 River Road, Conestoga, PA	S4500HB-11	рН				

The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3123270 3RD QTR 2020-3076 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3123270001	3076 River Road, Conestoga, PA	ASTM D6919-09		
3123270001	3076 River Road, Conestoga, PA	EPA 200.7	EPA ACID	
3123270001	3076 River Road, Conestoga, PA	EPA 200.7	EPA TRMD	
3123270001	3076 River Road, Conestoga, PA	EPA 300.0		
3123270001	3076 River Road, Conestoga, PA	EPA 410.4		
3123270001	3076 River Road, Conestoga, PA	EPA 420.4	420.4/9066	
3123270001	3076 River Road, Conestoga, PA	Field		
3123270001	3076 River Road, Conestoga, PA	S2540C-11		
3123270001	3076 River Road, Conestoga, PA	S4500HB-11		
3123270001	3076 River Road, Conestoga, PA	SM2130B-2011		
3123270001	3076 River Road, Conestoga, PA	SM2320B-2011		
3123270001	3076 River Road, Conestoga, PA	SM2510B-2011		
3123270001	3076 River Road, Conestoga, PA	SM5310B-2011		
3123270001	3076 River Road, Conestoga, PA	SW846 8260B		
3123270001	3076 River Road, Conestoga, PA	SW846 9020B		

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State Samples ☐Rental_Equipment Rev 8/04 Collected in .ed by Receiving Lab) Initial □Pickup □Labor ₹ È Æ 2 3 × Sample/COC Comments × Therm ID: Special Processing Sample Disposal g P Special USACE Navy Headspace/Volatiles? Custody Seals Present? (if present) Seals Intact? Received on Ice? COC/Labels Complete/Accurate? Cont. in Good Cond.? Correct Containers? Correct Sample Volumes? Correct Preservation? Composite_Sampling ALS Field Services: 2 Courier/Tracking #: No. of Coolers: "Matrix - Al=Air, DW=Drinking Water; GW=Groundwater; Ol=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater Cooler Temp: Other Reportable to PADEP? Standard CLP-like USACE EDDS: Format Type-500 ml None Alkalinity, HCO3 # QISMd Yes ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057 500 mil Tb, SpC Deliverables None ٣ Data ph. TDS, NO2, NO3, CI, SO4, F, Generated by ALS or Field Results Below 125 ml HN03 Time చ Metals: Ca, Fe, Mg, Mn, K, Na ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT 12/120 125 ml HN03 K, Na Date ದ Dissolved Metals: Ca, Fe, Mg, Mn, ANALYSES/METHOD REQUESTED SAMPLER. INSTRUCTIONS ON THE BACK. H2S04 250 ml REQUEST FOR ANALYSIS Sample റ NH3-N' COD CHAIN OF CUSTODY/ of Containers Per Received By / Company Name ЬW 40 m 8 오 2M846-8260 VOCs Ġ Enter Number H2S04 250 ml ¥ XOT N 125 ml H2S04 Ā HO-0 40 ml g 오 COL REVIEWED BY (signature): ð Preservative xintsM* OGGED BY(signature): Container Container Time 8-420 173 Type Size O 10 9. G 301 Fulling Mill Road • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430 1200 Time Date Rush-Subject to ALS approval and surcharges. X Normal-Standard TAT is 10-12 business days. * G=Grab; C=Composite Approved By: to Departed Law . Widdelaws, PA 1755 . Marc 713-404-541 . Let 715-541-1430 . www.dhyddd.com Sample 08/21/20 Date Relinguished By / Company Name Client Name: LCSWMA - Brian Sensenich Project Name#: LCSWMA - Quarterly Bill To: LCSWMA - Brian Sensenich Sample Description/Location (as it will appear on the lab report) Conestoga, PA 17516 (ALS) Environmental Address: 3076 Rover Road Brian Sensenich (717) 676-5779 -X No.: ۲ 3076RIVERRD Project Comments: Date Required: Contact: Phone#: TAT Email? Fax?



301 Fulling Mill Road Middletown, PA 17057

P: (717) 944-5541

F: (717) 944-1430

Condition of Sample Receipt Form

1. Were airbills / tracking numbers present and recorded? Tracking number: 2. Are Custody Seals on shipping containers intact? 3. Are Custody Seals on sample containers intact? 4. Is there a COC (Chain-of-Custody) present? 5. Are the COC and bottle labels complete, legible and in agreement? 5. Are the COC and bottle labels complete, legible and in agreement? 5. Does the COC contain sample locations? 5. Does the COC contain date and time of sample collection for all samples? 5. Does the COC contain sample collectors name? 5. Does the COC note the type(s) of preservation for all bottles? 5. Does the COC note the number of bottles submitted for each sample? 5. Does the COC note the type of sample, composite or grab? 5. Does the COC note the matrix of the sample(s)? 6. Are all aqueous samples requiring preservation preserved correctly? 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 8. Are all samples within holding times for the requested analyses? 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 6. Do Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? N/A	Client:	LCSWMA Work Order #: 3123270 Initials: DN	Date: <	ક/૫	
2. Are Custody Seals on shipping containers intact?	. Were airbil	ls / tracking numbers present and recorded?	(ONE	YES	NO
3. Are Custody Seals on sample containers intact?	Are Custon	•	MONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?				YES	NO
5. Are the COC and bottle labels complete, legible and in agreement? 5a. Does the COC contain sample locations?				4ES	NO
Sa. Does the COC contain sample locations?					NO
Sb. Does the COC contain date and time of sample collection for all samples?					NO
Sd. Does the COC note the type(s) of preservation for all bottles? 5e. Does the COC note the number of bottles submitted for each sample? 5f. Does the COC note the type of sample, composite or grab? 5g. Does the COC note the matrix of the sample(s)? 6. Are all aqueous samples requiring preservation preserved correctly? 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 8. Are all samples within holding times for the requested analyses? 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C 13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? 13c. Are all aqueous unpreserved SDWA samples pH 5-9? 13d. Did the client provide the SDWA sample location ID/Description? N/A YES 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES Cooler #:				- 7	NO
5e. Does the COC note the number of bottles submitted for each sample? 5f. Does the COC note the type of sample, composite or grab? 5g. Does the COC note the matrix of the sample(s)? 6. Are all aqueous samples requiring preservation preserved correctly? 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 8. Are all samples within holding times for the requested analyses? 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C 13a. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting? N/A YES 13b. Did the client provide a SDWA PWS ID#? N/A YES 13c. Are all aqueous unpreserved SDWA samples pH 5-9? N/A YES 13d. Did the client provide the SDWA sample location ID/Description? N/A YES 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES Cooler #:	5c. Does t	he COC contain sample collectors name?		YES	NO
5f. Does the COC note the type of sample, composite or grab? 5g. Does the COC note the matrix of the sample(s)? 6. Are all aqueous samples requiring preservation preserved correctly? 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 8. Are all samples within holding times for the requested analyses? 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C 13a. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting? N/A YES 13b. Did the client provide a SDWA PWS ID#? N/A YES 13c. Are all aqueous unpreserved SDWA sample bpt 5-9? N/A YES 13d. Did the client provide the SDWA sample location ID/Description? N/A YES Cooler #: Cooler #:	5d. Does 1	he COC note the type(s) of preservation for all bottles?		YES	NO
Sg. Does the COC note the matrix of the sample(s)?	5e. Does t	he COC note the number of bottles submitted for each sample?			NO
6. Are all aqueous samples requiring preservation preserved correctly? 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 8. Are all samples within holding times for the requested analyses? 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.). 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?. 11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C. 13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below. 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? 13c. Are all aqueous unpreserved SDWA samples pH 5-9? 13d. Did the client provide the SDWA sample location ID/Description? N/A YES 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES Cooler #:	5f. Does t	he COC note the type of sample, composite or grab?		(Es	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 8. Are all samples within holding times for the requested analyses? 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.). 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C 13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? 13c. Are all aqueous unpreserved SDWA samples pH 5-9? 13d. Did the client provide the SDWA sample location ID/Description? N/A YES 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES Cooler #:	5g. Does 1	he COC note the matrix of the sample(s)?		YES	NO
8. Are all samples within holding times for the requested analyses? 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C 13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? 13c. Are all aqueous unpreserved SDWA samples pH 5-9? 13d. Did the client provide the SDWA sample location ID/Description? N/A YES 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES Cooler #:	6. Are all aqu	eous samples requiring preservation preserved correctly?1	N/A	E	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C 13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? 13c. Are all aqueous unpreserved SDWA samples pH 5-9? 13d. Did the client provide the SDWA sample location ID/Description? N/A YES 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES Cooler #:				-	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?					NO
11. Were the samples received on ice?	9. Were all sa	mple containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		_	NO
12. Were sample temperatures measured at 0.0-6.0°C	10. Did we re	ceive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A		NO
13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below. 13a. Are the samples required for SDWA compliance reporting?	11. Were the	samples received on ice?		(E)	NO
13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below. 13a. Are the samples required for SDWA compliance reporting?	12. Were sam	ple temperatures measured at 0.0-6.0°C		15.25	1
13b. Did the client provide a SDWA PWS ID#?	13. Are the sa	amples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(E)	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?					60
13d. Did the client provide the SDWA sample location ID/Description?		•			NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?					NO
Cooler #:					NO
	13e. Did t	he client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO
Tomporatura (95): 15		Cooler #:			
Tomporature (90): [,]	55	5			1
Temperature (*C). 1 0		Temperature (°C): [J			
Thermometer ID: 799		Thermometer ID: 794			
Radiological (µCi):	1	Radiological (µCi):	، المينية ،		

COMMENTS (Required for all NO responses above and any sample non-conformance):

¹Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis

Rev 1/20/2020





NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

September 10, 2020

Mr. Daniel Brown Lancaster County Solid Waste Authority 1299 Hbg Pike, P.O. Box 4425 Lancaster, PA 17604

Certificate of Analysis

Project Name: FREY FARM Workorder: 3123269

Purchase Order: PO1000126 Workorder ID: 3RD QTR 2020 3079 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 21, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki, Ms. Jordan Gallagher, Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Susan J Scherer Project Coordinator

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SAMPLE SUMMARY

Workorder: 3123269 3RD QTR 2020 3079 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3123269001	3079RIVERRD	Water	8/21/2020 15:22	8/21/2020 17:30	Mr. Brian G Shade
3123269002	FIELD BLANK	Water	8/21/2020 15:29	8/21/2020 17:30	Mr. Brian G Shade
3123269003	TRIP BLANK	Water	8/21/2020 17:30	8/21/2020 17:30	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3123269 3RD QTR 2020 3079 RIVER RD

Notes

- -- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.
- -- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- -- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- -- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- -- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- -- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

- J Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
- U Indicates that the analyte was Not Detected (ND)
- N Indicates presumptive evidence of the presence of a compound
- MDL Method Detection Limit
- PQL Practical Quantitation Limit
- RDL Reporting Detection Limit
- ND Not Detected indicates that the analyte was Not Detected at the RDL
- Cntr Analysis was performed using this container
- RegLmt Regulatory Limit
- LCS Laboratory Control Sample
- MS Matrix Spike
- MSD Matrix Spike Duplicate
- DUP Sample Duplicate
- %Rec Percent Recovery
- RPD Relative Percent Difference
- LOD DoD Limit of Detection
- LOQ DoD Limit of Quantitation
- DL DoD Detection Limit
- I Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
- (S) Surrogate Compound
- NC Not Calculated
- Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3123269 3RD QTR 2020 3079 RIVER RD

Lab ID: 312369001 Date Collected: 8/21/2020 15:22 Matrix: Water

Sample ID: 3079RIVERRD Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/26/20 05:21	PDK	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/26/20 05:21	PDK	K
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	Ву	Analyzed	Ву	Cntr
1,2-Dichloroethane-d4 (S)	92.3		%	62 - 133	SW846 8260B			8/26/20 05:21	PDK	K
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			8/26/20 05:21	PDK	K
Dibromofluoromethane (S)	92.7		%	78 - 116	SW846 8260B			8/26/20 05:21	PDK	K
Toluene-d8 (S)	100		%	76 - 127	SW846 8260B			8/26/20 05:21	PDK	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	32		mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	С
Alkalinity, Total	32	1	mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	Α
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			8/29/20 02:47	JXL	В
Chemical Oxygen Demand (COD)	22		mg/L	15	EPA 410.4			9/9/20 22:10	JAM	В
Chloride	32.7		mg/L	2.0	EPA 300.0			8/22/20 16:45	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/20 16:45	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/26/20 11:21	PAG	I
Nitrate-N	ND		mg/L	0.20	EPA 300.0			8/22/20 16:45	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/22/20 16:45	MBW	С
pН	6.13	2	pH_Units		S4500HB-11			8/25/20 20:33	R2B	С
Phenolics	0.005		mg/L	0.005	EPA 420.4	8/26/20 06:53	C D	8/26/20 10:35	VXF	Н
Specific Conductance	192		umhos/cm	1	SM2510B-2011		'	8/25/20 20:33	R2B	C
Sulfate	10.8		mg/L	2.0	EPA 300.0			8/22/20 16:45		_
Canalo	10.0		111g/ L	2.0	L1 /1 000.0			3,22,20 10.43	۷۷ ک.۰۰	9

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ANALYTICAL RESULTS

Workorder: 3123269 3RD QTR 2020 3079 RIVER RD

Lab ID: 312369001 Date Collected: 8/21/2020 15:22 Matrix: Water

Sample ID: 3079RIVERRD Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
Total Dissolved Solids	150		mg/L	25	S2540C-11			8/26/20 11:06	KXH	С
Total Organic Carbon (TOC)	ND	3,4, 5	mg/L	0.50	SM5310B-2011			8/26/20 00:58	PAG	F
Turbidity	0.19		NTU	0.10	SM2130B-2011			8/22/20 07:43	R2B	С
METALS										
Calcium, Total	10.3		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:06	SRT	D
Calcium, Dissolved	10.5		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:08	SRT	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:06	SRT	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:08	SRT	Е
Magnesium, Total	5.6		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:06	SRT	D
Magnesium, Dissolved	5.7		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:08	SRT	Ε
Manganese, Total	0.12		mg/L	0.0025	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:06	SRT	D
Manganese, Dissolved	0.12		mg/L	0.0050	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:08	SRT	Ε
Potassium, Total	2.2		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:06	SRT	D
Potassium, Dissolved	2.1		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:08	SRT	Ε
Sodium, Total	14.2		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:06	SRT	D
Sodium, Dissolved	14.6		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:08	SRT	Ε
FIELD PARAMETERS										
pH, Field (SM4500B)	5.38		pH_Units		Field			8/21/20 15:22	BGS	М
Specific Conductance, Field	207		umhos/cm	1	Field			8/21/20 15:22	BGS	М
Temperature	23.80		Deg. C		Field			8/21/20 15:22	BGS	М

Ms. Susan J Scherer Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3123269 3RD QTR 2020 3079 RIVER RD

Lab ID: 312369002 Date Collected: 8/21/2020 15:29 Matrix: Water

Sample ID: FIELD BLANK Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
Toluene	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/27/20 00:15	PDK	Α
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 00:15	PDK	Α
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	Ву	Analyzed	Ву	Cntr
1,2-Dichloroethane-d4 (S)	92.4		%	62 - 133	SW846 8260B			8/27/20 00:15	PDK	Α
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			8/27/20 00:15	PDK	Α
Dibromofluoromethane (S)	91.9		%	78 - 116	SW846 8260B			8/27/20 00:15	PDK	Α
Toluene-d8 (S)	100		%	76 - 127	SW846 8260B			8/27/20 00:15	PDK	Α

Ms. Susan J Scherer Project Coordinator

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3123269 3RD QTR 2020 3079 RIVER RD

Lab ID: 312369003 Date Collected: 8/21/2020 17:30 Matrix: Water

Sample ID: TRIP BLANK Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
Toluene	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/26/20 23:29	PDK	Α
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/26/20 23:29	PDK	Α
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	Ву	Analyzed	Ву	Cntr
1,2-Dichloroethane-d4 (S)	92.1		%	62 - 133	SW846 8260B			8/26/20 23:29	PDK	Α
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			8/26/20 23:29	PDK	Α
Dibromofluoromethane (S)	92.8		%	78 - 116	SW846 8260B			8/26/20 23:29	PDK	Α
Toluene-d8 (S)	100		%	76 - 127	SW846 8260B			8/26/20 23:29	PDK	Α

Ms. Susan J Scherer Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3123269 3RD QTR 2020 3079 RIVER RD

PARAMETE	QUAL	IFIERS
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Lab ID Sample ID Analytical Method Analyte 3123269001 3079RIVERRD 1 SM2320B-2011 Alkalinity, Total

The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.

3123269001 3079RIVERRD S4500HB-11 рΗ 2

The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

3123269001 3079RIVERRD SM5310B-2011 Total Organic Carbon (TOC) 3

The QC sample type MS for method 415.1/9060/5310B was outside the control limits for the analyte Total Organic Carbon (TOC). The % Recovery was reported as 175 and the control limits were 85 to 115.

3079RIVERRD SM5310B-2011 Total Organic Carbon (TOC)

The QC sample type MSD for method 415.1/9060/5310B was outside the control limits for the analyte Total Organic Carbon (TOC). The % Recovery was reported as 224 and the control limits were 85 to 115.

SM5310B-2011 3123269001 3079RIVERRD Total Organic Carbon (TOC) 5

The QC sample type MSD for method 415.1/9060/5310B was outside the control limits for the analyte Total Organic Carbon (TOC). The RPD was reported as 24.4 and the upper control limit is 15.

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3123269 3RD QTR 2020 3079 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3123269001	3079RIVERRD	ASTM D6919-09		
3123269001	3079RIVERRD	EPA 200.7	EPA ACID	
3123269001	3079RIVERRD	EPA 200.7	EPA TRMD	
3123269001	3079RIVERRD	EPA 300.0		
3123269001	3079RIVERRD	EPA 410.4		
3123269001	3079RIVERRD	EPA 420.4	420.4/9066	
3123269001	3079RIVERRD	Field		
3123269001	3079RIVERRD	S2540C-11		
3123269001	3079RIVERRD	S4500HB-11		
3123269001	3079RIVERRD	SM2130B-2011		
3123269001	3079RIVERRD	SM2320B-2011		
3123269001	3079RIVERRD	SM2510B-2011		
3123269001	3079RIVERRD	SM5310B-2011		
3123269001	3079RIVERRD	SW846 8260B		
3123269001	3079RIVERRD	SW846 9020B		
3123269002	FIELD BLANK	SW846 8260B		
3123269003	TRIP BLANK	SW846 8260B		

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301 Fulling Mill Road + Middletown, PA 17057 + 717.944.5541 + Fax: 717.944.1430	44.5541 • Fax: 717.944.14	92		SAMPL	SAMPLER, INSTRUCTIONS ON THE BACK	RUCTIO	VS ON T	HE BAC	¥.		=	ļ				
Client Name: Lancaster County Solid Waste MA	MA	Container	P AG	AN	AN	95	ı	占	Ы	7	, La-	- n		d by Rec	ted by Receiving Lab)	(qg
Address: 1299 Hamisburg Pike, P.O. Box 4424	24	Container Size	40 ml	125 ml	250 ml	40 ml	1	250 ml	125 ml	125 ml	200 ml	500 ml	Cooler Temp: 9 Therm ID: 294	(V	20	
Lancaster, PA 17604		Preservative	HC	H2S04	H2S04	오	1	H2S04	HNO3	HNO3	None	None	No. of Coolers:	×	Initial	<u>=</u>
Contact: Dan Brown					ANA	ANALYSES/METHOD REQUESTED	THOD R	EQUEST	9				Custody Seals Present?	_	_	
Phone#: (717) 735-0193									٠,				(If present) Seals Intact?	L	L	
Project Name/#: LCSWMA - Quarterly Fire Co.	So.								IM .	8	'B'1		Received on Ice?	<u> </u>		
Bill To: Lancaster County Solid Waste MA		_				w0000			gМ .	N')	os		COC/Labels Complete/Accurate?		L	
X Normal-Standard TAT is 10-12 business days.	12 business days.								9J , Fe	,nM	'cı'		Cont. In Good Cond.?		L	
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Fax? -Y No.:			_	Н	×	918	å			:sle:	Spc	tinile	Headspace/Volatiles?		L	
Sample Description/Location	Sample		001	0-0	(0)	MS	W:		N ')	qey			CourierTracking #:]		1
(as it will appear on the lab report)	Date Time	9.	Ц		Enter Number of Containers Per Sample or Field Results Below	r of Conta	ners Per S	ample or	Field Resu	ilts Below	d .	1	Sample/COC Comments	ments		
1 3079RIVERRD	08/21/20 1522	G DW	1 2	1	2	2 x		-	-	+	-	-				
2. Field Blank	08/21/20 1529	G DW				2										
3. Trip Blank	08/21/20	G DW				つか										
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	Project Comments:	LOGGED BY(BY(signature):	2570	3741	Standard	Special Processing
		REVIEWED BY	ED BY(signature):	21/10	7001	tta CLP-like	USACE
	Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time Di elive	Navy
	1 NO CHANGERIES ALL	8-21-20	(22)	2 May 12 8	1/01/12/8	/230	
AI	3			4		Reportable to PADEP?	Sample Disposal
_<	9			9			Lab X
1	7		_	8		# diswd	Special
_	6			10		EDDS: Format Type-	
	· G=Grab; C=Composite	Ì	trix - Al=Air	"Mairix - Al=Air, DW=Drinking Water; GW=Groundwater; OI=OII; OL=Other Liquid; SL=Sludge; SO=Soil: WP=Wipe; WW=Wastewater	.iquid; SL=Si	udge: SO=Soil: WP=Wipe; WWx	astewater
		ALS ENV	IRONME	INVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057	MIDDLETC	WN, PA 17057	

State Samples Collected In

Lab X

Rev 8/04



301 Fulling Mill Road Middletown, PA 17057 P: (717) 944-5541 F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWMA Work Order #: 3123269 Initials: DN	Date: <	8/21	
Were airbills / tracking numbers present and recorded?	(IGNE	YES	NO
Tracking number:			1000
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	WONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		(ES	NO.
5b. Does the COC contain date and time of sample collection for all samples?		ES!	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		· YES	NO.
Se. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		(Cs	NO
5g. Does the COC note the matrix of the sample(s)?		V2S	NO
6. Are all aqueous samples requiring preservation preserved correctly?1	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(ES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, et	c.)	KES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?	,	(E)	NO
12. Were sample temperatures measured at 0.0-6.0°C Jene > 0	60	YES	(NO)
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(FES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	(NO)
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO
Cooler #:			
<i>a</i>			- 1
Temperature (°C):			
Thermometer ID: 794	83		
			
Radiological (μCi):	b stylen.		
COMMENTS (Required for all NO responses above and any sample non-confo	rmance):	J. C. C. C.	T

¹Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis

Rev 1/20/2020





NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

September 10, 2020

Mr. Daniel Brown Lancaster County Solid Waste Authority 1299 Hbg Pike, P.O. Box 4425 Lancaster, PA 17604

Certificate of Analysis

Project Name: CONTIGUOUS LANDOWNER- Workorder:

3088 RIVER RD

Purchase Order: PO1000126 Workorder ID: 3RD QTR 2020-3088 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 21, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki , Ms. Jordan Gallagher , Landowner , Mr. Jeff

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Susan J Scherer Project Coordinator

3123268

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SAMPLE SUMMARY

Workorder: 3123268 3RD QTR 2020-3088 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3123268001	3088 River Road, Conestoga PA	Water	8/21/2020 12:10	8/21/2020 17:30	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3123268 3RD QTR 2020-3088 RIVER RD

Notes

- -- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.
- -- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- -- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- -- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- -- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- -- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

- J Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
- U Indicates that the analyte was Not Detected (ND)
- N Indicates presumptive evidence of the presence of a compound
- MDL Method Detection Limit
- PQL Practical Quantitation Limit
- RDL Reporting Detection Limit
- ND Not Detected indicates that the analyte was Not Detected at the RDL
- Cntr Analysis was performed using this container
- RegLmt Regulatory Limit
- LCS Laboratory Control Sample
- MS Matrix Spike
- MSD Matrix Spike Duplicate
- DUP Sample Duplicate
- %Rec Percent Recovery
- RPD Relative Percent Difference
- LOD DoD Limit of Detection
- LOQ DoD Limit of Quantitation
 DL DoD Detection Limit
 - I Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
- (S) Surrogate Compound
- NC Not Calculated
- * Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3123268 3RD QTR 2020-3088 RIVER RD

Lab ID: 312368001 Date Collected: 8/21/2020 12:10 Matrix: Water

Sample ID: 3088 River Road, Conestoga PA Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/26/20 04:58	PDK	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/26/20 04:58	PDK	K
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	Ву	Analyzed	Ву	Cntr
1,2-Dichloroethane-d4 (S)	93.3		%	62 - 133	SW846 8260B			8/26/20 04:58	PDK	K
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			8/26/20 04:58	PDK	K
Dibromofluoromethane (S)	93.2		%	78 - 116	SW846 8260B			8/26/20 04:58	PDK	K
Toluene-d8 (S)	102		%	76 - 127	SW846 8260B			8/26/20 04:58	PDK	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	168		mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	С
Alkalinity, Total	168	1	mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	Α
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			8/29/20 11:29	JXL	В
Chemical Oxygen Demand (COD)	22		mg/L	15	EPA 410.4			9/9/20 22:10	JAM	В
Chloride	222		mg/L	5.0	EPA 300.0			8/26/20 06:52	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/20 16:30	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/25/20 15:59	PAG	1
Nitrate-N	5.7		mg/L	0.20	EPA 300.0			8/22/20 16:30	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/22/20 16:30	MBW	С
рН	6.94	2	pH_Units		S4500HB-11			8/25/20 20:33	R2B	С
Phenolics	0.006		mg/L	0.005	EPA 420.4	8/26/20 06:53	C_D	8/26/20 10:35	VXF	Н
Specific Conductance	1010		umhos/cm	1	SM2510B-2011		_	8/25/20 20:33	R2B	С
Sulfate	8.4		mg/L	2.0	EPA 300.0			8/22/20 16:30	MBW	_
Canato	J. T		ilig/L	2.0	LI A 300.0			5,22,20 10.50	1VID VV	J

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3123268 3RD QTR 2020-3088 RIVER RD

Lab ID: 312368001 Date Collected: 8/21/2020 12:10 Matrix: Water

Sample ID: 3088 River Road, Conestoga PA Date Received: 8/21/2020 17:30

Total Dissolved Solids 52 Total Organic Carbon (TOC) NE Turbidity 0.2 METALS Calcium, Total 0.1 Calcium, Dissolved 0.1 Iron, Total NE Iron, Dissolved NE Magnesium, Total 0.0	22	Flag	Units	RDL	Method	Prepared	By	Analyzed	Dv	0
Total Organic Carbon (TOC) Turbidity 0.2 METALS Calcium, Total Calcium, Dissolved Iron, Total Iron, Dissolved Magnesium, Total 0.0						1 Toparca	Dy	Allalyzeu	Ву	Cntr
Turbidity 0.2 METALS Calcium, Total 0.1 Calcium, Dissolved 0.1 Iron, Total NE Iron, Dissolved NE Magnesium, Total 0.0	_	3	mg/L	25	S2540C-11			8/31/20 13:34	KXH	С
METALS Calcium, Total 0.1 Calcium, Dissolved 0.1 Iron, Total NE Iron, Dissolved NE Magnesium, Total 0.0	D		mg/L	0.50	SM5310B-2011			8/26/20 00:58	PAG	F
Calcium, Total 0.1 Calcium, Dissolved 0.1 Iron, Total NE Iron, Dissolved NE Magnesium, Total 0.0	23		NTU	0.10	SM2130B-2011			8/22/20 07:43	R2B	С
Calcium, Dissolved 0.1 Iron, Total NE Iron, Dissolved NE Magnesium, Total 0.0										
Iron, TotalNEIron, DissolvedNEMagnesium, Total0.0	16		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:02	SRT	D
Iron, Dissolved NE Magnesium, Total 0.0	14		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:05	SRT	E
Magnesium, Total 0.0	D		mg/L	0.030	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:02	SRT	D
=	D		mg/L	0.060	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:05	SRT	Е
	055		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:02	SRT	D
Magnesium, Dissolved NE	D		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:05	SRT	Е
Manganese, Total NE	D		mg/L	0.0025	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:02	SRT	D
Manganese, Dissolved NE	D		mg/L	0.0050	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:05	SRT	Е
Potassium, Total 3.1	.1		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:02	SRT	D
Potassium, Dissolved 2.8	8		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:05	SRT	Е
Sodium, Total 20	09		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 11:02	SRT	D
Sodium, Dissolved 22	26		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:05	SRT	E
FIELD PARAMETERS										
pH, Field (SM4500B) 6.3	33	pl	H_Units		Field			8/21/20 12:10	BGS	M
Specific Conductance, Field 32	28	un	nhos/cm	1	Field			8/21/20 12:10	BGS	M
Temperature 19					Field			8/21/20 12:10	BGS	М

Ms. Susan J Scherer Project Coordinator

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3123268 3RD QTR 2020-3088 RIVER RD

PARAMETER	QUALIFIERS
------------------	------------

Lab ID	#	Sample ID	Analytical Method	Analyte
3123268001	1	3088 River Road, Conestoga PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinit	ty is titrate	ed to a pH of 4.5 and reported as mg (CaCO3/L.	
3123268001	2	3088 River Road, Conestoga PA	S4500HB-11	На

The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

3123268001 3 3088 River Road, Conestoga PA S2540C-11 Total Dissolved Solids

The sample was originally run within hold time, but required further analysis that exceeded hold time.

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3123268 3RD QTR 2020-3088 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3123268001	3088 River Road, Conestoga PA	ASTM D6919-09		
3123268001	3088 River Road, Conestoga PA	EPA 200.7	EPA ACID	
3123268001	3088 River Road, Conestoga PA	EPA 200.7	EPA TRMD	
3123268001	3088 River Road, Conestoga PA	EPA 300.0		
3123268001	3088 River Road, Conestoga PA	EPA 410.4		
3123268001	3088 River Road, Conestoga PA	EPA 420.4	420.4/9066	
3123268001	3088 River Road, Conestoga PA	Field		
3123268001	3088 River Road, Conestoga PA	S2540C-11		
3123268001	3088 River Road, Conestoga PA	S4500HB-11		
3123268001	3088 River Road, Conestoga PA	SM2130B-2011		
3123268001	3088 River Road, Conestoga PA	SM2320B-2011		
3123268001	3088 River Road, Conestoga PA	SM2510B-2011		
3123268001	3088 River Road, Conestoga PA	SM5310B-2011		
3123268001	3088 River Road, Conestoga PA	SW846 8260B		
3123268001	3088 River Road, Conestoga PA	SW846 9020B		

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4				ì	HAIN	CHAIN OF CUSTODY/	STO	7	త	Generated by ALS	s			-
(ALS) Environmental	•	-	2	KE	S OF S	REQUES I FOR ANALYSIS	ANA	YSIS						 5
Hittpreed Lim + Middlem, N. 1782 + Pane, 71344-5541 + San 71344-1480 + were Joydda.	me deplate on		ALL SH	7	KEAS MI	ADED AREAS MOST BE COMPLETED BY	OMPLE	EU BY I	I HE CLIENI	-	= '			1
34 Dogwood Lane + Middletown, PA 17057 + 717,944,5541 + Fex. 717,944,1430	41 * FBX: 717.944.1430		H	SAMIL	LEK.	SAMPLER, INSTRUCTIONS ON THE BACK	ONS ON	HE BA			-		3268*	
Client Name: LCSWMA - Hans Weber and Deb Kalbach	Kalbach	Type	AG	AN	AN	8	-	Ы	۲	చ	٦	1	ted t	ted by Receiving Lab)
Address: 3088 River Road		Container	40 ml	125 ml	1 250 ml	40 ml	I	250 ml	125 ml	125 ml	900 ml	500 ml Cc	Cooler Temp: Therm ID:	hb2
Conestoga, PA 17516		Preservative	를 로	H2S04	4 H2SO4	무	1	H2SO4	HNO3	HNO3	None	None No.	No. of Coolers:	N Initial
Contact: Hans Weber and Deb Kalbach					A	ANALYSES/METHOD REQUESTED	METHOD	REQUEST	≘				Custody Seals Present?	
Phone#: (717) 419-7982									,				(if present) Seals Intact?	
Project Name#: LCSWMA - Quarterly		_							nM ,	E	٠٤.		Received on Ice?	
Bill To: LCSWMA - Hans Weber and Deb Kalbach	ach								6M ,	c' N	¢OS	-	COC/Labers Complete/Accurate?	
TAT Normal-Standard TAT is 10-12 business days.	business days.					1			94 ,6¢	i ,aM.	3' CI'		Cont. in Good Cond.?	
ush-Subject to ALS app	and surcharges.		_			00) :s	6W	ON	3	Correct Containers?	
Date Required: Appro	Approved By:					Λ 09		ac	Meta	, Fe,	'ZON	нсо	Correct Sample Volumes?	
				١		Z8-9‡		n' co		s) :s		,Viin	Correct Preservation?	
Sample Description/Location		O 10 latrix	301	10-0	XOT	8MS	ЕМ	-EHN	Disso K' NS	Meta	T ,Hq 2 ,dT		Headspace/Volatiles? Counier/Tracking #:	
(as it will appear on the lab report)	Date Time	_			Enter Nun	Enter Number of Containers Per	tainers Per	Sample or Field Results Below	Field Res	ults Belov			Sample/COC Comments	ents
1 3088RIVER RD 08	08/21/20 1210	B DW	2	-	2	2	×	-	-	-	-	-		
2					_									
3														
6 4														
2														
9														
2														
8													i	
6													10	
10													□Composite_Sampling □Re □Cother.	ORental_Equipment
Project Comments:	LOGGED BY (signature):	(signature)						3140			s	Standard	Special Processing	State Samples
	REVIEWED BY(signature):	3Y(signatur	;;					22140	3-1		ata srable]CLP-ike	USACE	Collected in
Relinguished By Company Name	Date	Time		Rec	eived By /	Received By I Company Name	Name	5 0 0	Date	Time		USACE	Navy	ž
· MSAMOREN AL	X 8-21-20	1330	7		11.	1 cira	19	VQ V	07//2	130	a			2
3			4	ļ							Report	Reportable to PADEP?	P? Sample Disposal	× A
2			9		8						Yes		Lab	S
7											# QISMA		Special	
6			유								EDDS: F	EDDS: Format Type-		
G=Grab; C=Composite	Composite **M	atrix - Al=	Alr. DW=[Orinking W	ater; GW=	Groundwat	er, Ol=Oil; (OL=Other L	Iquid; SL=	Sludge: S	O=Soil; W	**Matrix - Al=Alr, DW=Drinking Water, GW=Groundwater, OL=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater	=Wastewater	
	ALO CIN	202	EN AL		GACCA	300.00	00850	SAN	MIDDLE	N O	A 17057			Rev 8/04



301 Fulling Mill Road Middletown, PA 17057 P: (717) 944-5541 F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWMA Work Order #: 323268 Initials: DN	Date:	8/11	
Were airbills / tracking numbers present and recorded? Tracking number:	€NE	YES	NO
2. Are Custody Seals on shipping containers intact?	MONE	YES	NO
3. Are Custody Seals on sample containers intact?			NO
4. Is there a COC (Chain-of-Custody) present?			NO
5. Are the COC and bottle labels complete, legible and in agreement?			NO
Sa. Does the COC contain sample locations?			NO
5b. Does the COC contain date and time of sample collection for all samples?			NO
Sc. Does the COC contain sample collectors name?			NO
5d. Does the COC note the type(s) of preservation for all bottles?		VE S	NO
Se. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		G S	NO
5g. Does the COC note the matrix of the sample(s)?		VES	NO
6. Are all aqueous samples requiring preservation preserved correctly?1	N/A	Œ	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		ES	NO
8. Are all samples within holding times for the requested analyses?		YES	ИО
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		163	NO
10: Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		(E)	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	(G)
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	6
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?		YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	. N/A	YES	NO
Cooler #:			
Temperature (°C):	65		
		-9	
Thermometer ID: 794		_	
Radiological (µCi):		, اس	
	100 S		

COMMENTS (Required for all NO responses above and any sample non-conformance):

¹Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis

Rev 1/20/2020





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September 10, 2020

Mr. Daniel Brown Lancaster County Solid Waste Authority 1299 Hbg Pike, P.O. Box 4425 Lancaster, PA 17604

Certificate of Analysis

Project Name: CONTIGUOUS LANDOWNER- Workorder:

3100 RIVER RD

Purchase Order: PO1000126 Workorder ID: 3RD QTR 2020-3100 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 21, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki , Ms. Jordan Gallagher , Landowner , Mr. Jeff

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Susan J Scherer Project Coordinator

3123267

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SAMPLE SUMMARY

Workorder: 3123267 3RD QTR 2020-3100 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3123267001	3100 River Road, Conestoga, PA	Water	8/21/2020 12:25	8/21/2020 17:30	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3123267 3RD QTR 2020-3100 RIVER RD

Notes

- -- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.
- -- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- -- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- -- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- -- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- -- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

- J Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
- U Indicates that the analyte was Not Detected (ND)
- N Indicates presumptive evidence of the presence of a compound
- MDL Method Detection Limit
- PQL Practical Quantitation Limit
- RDL Reporting Detection Limit
- ND Not Detected indicates that the analyte was Not Detected at the RDL
- Cntr Analysis was performed using this container
- RegLmt Regulatory Limit
- LCS Laboratory Control Sample
- MS Matrix Spike
- MSD Matrix Spike Duplicate
- DUP Sample Duplicate
- %Rec Percent Recovery
 RPD Relative Percent Di
- RPD Relative Percent Difference LOD DoD Limit of Detection
- LOQ DoD Limit of Quantitation
- DL DoD Detection Limit
- I Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
- (S) Surrogate Compound
- NC Not Calculated
- * Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3123267 3RD QTR 2020-3100 RIVER RD

Lab ID: 3123267001 Date Collected: 8/21/2020 12:25 Matrix: Water

Sample ID: 3100 River Road, Conestoga, PA Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/26/20 04:35	PDK	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/26/20 04:35	PDK	K
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	Ву	Analyzed	Ву	Cntr
1,2-Dichloroethane-d4 (S)	92.9		%	62 - 133	SW846 8260B			8/26/20 04:35	PDK	K
4-Bromofluorobenzene (S)	104		%	79 - 114	SW846 8260B			8/26/20 04:35	PDK	K
Dibromofluoromethane (S)	91.7		%	78 - 116	SW846 8260B			8/26/20 04:35	PDK	K
Toluene-d8 (S)	100		%	76 - 127	SW846 8260B			8/26/20 04:35	PDK	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	11		mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	С
Alkalinity, Total	11	1	mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	Α
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			8/29/20 03:01	JXL	В
Chemical Oxygen Demand (COD)	23		mg/L	15	EPA 410.4			9/9/20 22:10	JAM	В
Chloride	41.8		mg/L	2.0	EPA 300.0			8/22/20 16:15	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/20 16:15	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/25/20 15:29	PAG	1
Nitrate-N	4.7		mg/L	0.20	EPA 300.0			8/22/20 16:15	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/22/20 16:15	MBW	С
рН	5.64	2	pH_Units		S4500HB-11			8/25/20 20:33	R2B	С
Phenolics	0.005		mg/L	0.005	EPA 420.4	8/26/20 06:53	C_D	8/26/20 10:35	VXF	Н
Specific Conductance	216		umhos/cm	1	SM2510B-2011		_	8/25/20 20:33	R2B	С
Sulfate	8.7		mg/L	2.0	EPA 300.0			8/22/20 16:15	MBW	-
	J.,		9, =	0				5,22,25 15.16		•

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ANALYTICAL RESULTS

Workorder: 3123267 3RD QTR 2020-3100 RIVER RD

Lab ID: 3123267001 Date Collected: 8/21/2020 12:25 Matrix: Water

Sample ID: 3100 River Road, Conestoga, PA Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
Total Dissolved Solids	162		mg/L	25	S2540C-11			8/26/20 11:06	KXH	С
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/26/20 00:58	PAG	F
Turbidity	0.15		NTU	0.10	SM2130B-2011			8/22/20 07:43	R2B	С
METALS										
Calcium, Total	14.0		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 10:59	SRT	D
Calcium, Dissolved	14.5		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:02	SRT	Е
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/25/20 17:03	SXC	8/26/20 10:59	SRT	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:02	SRT	Е
Magnesium, Total	6.2		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 10:59	SRT	D
Magnesium, Dissolved	6.4		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:02	SRT	Е
Manganese, Total	0.0081		mg/L	0.0025	EPA 200.7	8/25/20 17:03	SXC	8/26/20 10:59	SRT	D
Manganese, Dissolved	0.0082		mg/L	0.0050	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:02	SRT	Е
Potassium, Total	1.6		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 10:59	SRT	D
Potassium, Dissolved	1.6		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:02	SRT	Е
Sodium, Total	16.2		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 10:59	SRT	D
Sodium, Dissolved	16.9		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:02	SRT	Е
FIELD PARAMETERS										
pH, Field (SM4500B)	5.09		pH_Units		Field			8/21/20 12:25	BGS	М
Specific Conductance, Field	259		umhos/cm	1	Field			8/21/20 12:25	BGS	М
Temperature	22.00		Deg. C		Field			8/21/20 12:25	BGS	М

Ms. Susan J Scherer Project Coordinator

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3123267 3RD QTR 2020-3100 RIVER RD

PARAMETER QUALIFIER	IFIERS	AL	QU	ΓER	MET	Αľ	R	Α	P
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Lab ID	#	Sample ID	Analytical Method	Analyte
3123267001	1	3100 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity	is titrate	ed to a pH of 4.5 and reported as mg (CaCO3/L.	
3123267001	2	3100 River Road, Conestoga, PA	S4500HB-11	рН

The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3123267 3RD QTR 2020-3100 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3123267001	3100 River Road, Conestoga, PA	ASTM D6919-09		
3123267001	3100 River Road, Conestoga, PA	EPA 200.7	EPA ACID	
3123267001	3100 River Road, Conestoga, PA	EPA 200.7	EPA TRMD	
3123267001	3100 River Road, Conestoga, PA	EPA 300.0		
3123267001	3100 River Road, Conestoga, PA	EPA 410.4		
3123267001	3100 River Road, Conestoga, PA	EPA 420.4	420.4/9066	
3123267001	3100 River Road, Conestoga, PA	Field		
3123267001	3100 River Road, Conestoga, PA	S2540C-11		
3123267001	3100 River Road, Conestoga, PA	S4500HB-11		
3123267001	3100 River Road, Conestoga, PA	SM2130B-2011		
3123267001	3100 River Road, Conestoga, PA	SM2320B-2011		
3123267001	3100 River Road, Conestoga, PA	SM2510B-2011		
3123267001	3100 River Road, Conestoga, PA	SM5310B-2011		
3123267001	3100 River Road, Conestoga, PA	SW846 8260B		
3123267001	3100 River Road, Conestoga, PA	SW846 9020B		

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Control Cont	34 Dogwood Lane • Middletown, PA 17057 • 717.9	944,5541 + FBX; 717.		-		SAMP	ER. INS	TRUCTIC	NO SNC	THE BA	CK.			3 1 2	3 2 6 7 *	- 1
Control New Plant Cont	Client Name: LCSWMA - Larry Kirchner		-	Container		AN	AN	90	-	Ъ		전	<u>-</u> a	i	ted by Receiving	E
Conceting PA 17516	Address: 3100 River Road			Container		-	-	40 ml	ı	250 ml	125 ml	125 ml	500 ml	_	12 Them ID:	<u>}_</u>
Contract Conestoga, PA 17516			Presenda		H2SO4	_	오	1	H2S04	HNO3	HN03	None		> -	゠	
Figure Contract	Contact: Larry Kirchner						AN	LYSESII	METHOD	REQUES	2				dy Scals Present?	
Manual Encounter Company Solid Vision Bay Manual Strandard TAT is for the business days. Company Solid Vision Bay Company Vision Ba	Phone#: (717) 584-0030			H	L	L	L		L	L	١,				(If present) Seals Intact?	1
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100RIVERRO	Sample Description/Location	Sample				0-0	OT S	MS 5	HI FW	HN	K'ı B B Dis	em Mei	,Hq		r/Tracking #:	ŁΙ
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301 Fulling Mill Road Middletown, PA 17057 P: (717) 944-5541

F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWMA Work Order #: 3123267 Initials: DN	ate: <	8/II	
Were airbills / tracking numbers present and recorded? Tracking number:	€ NE	YES	NO
2. Are Custody Seals on shipping containers intact?	TONE	YES	NO
3. Are Custody Seals on sample containers intact?		YES	NO
4. Is there a COC (Chain-of-Custody) present?			МО
5. Are the COC and bottle labels complete, legible and in agreement?			ИО
5a. Does the COC contain sample locations?			NO
5b. Does the COC contain date and time of sample collection for all samples?			NO
5c. Does the COC contain sample collectors name?			NO
5d. Does the COC note the type(s) of preservation for all bottles?		VE S	NO
Se. Does the COC note the number of bottles submitted for each sample?		~	ИО
Sf. Does the COC note the type of sample, composite or grab?			NO
Sg. Does the COC note the matrix of the sample(s)?			NO
6. Are all aqueous samples requiring preservation preserved correctly?1	N/A	E	NO !
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(ES	NO
8. Are all samples within holding times for the requested analyses?			NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)			NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?		YES	NO
11. Were the samples received on ice?		(E)	NO
			™
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		Œ	NO
13a. Are the samples required for SDWA compliance reporting?		YES	(O)
13b. Did the client provide a SDWA PWS ID#?		YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
, so the the entire provide the sent reality to the sent reality t	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	МО
Cooler #:		0 0.00	
Temperature (°C):			÷
Thermometer ID: 794			
Radiological (µCi):			
	· 50°F		

COMMENTS (Required for all NO responses above and any sample non-conformance):

¹Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis

Rev 1/20/2020





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September 10, 2020

Mr. Daniel Brown Lancaster County Solid Waste Authority 1299 Hbg Pike, P.O. Box 4425 Lancaster, PA 17604

Certificate of Analysis

Project Name: CONTIGUOUS LANDOWNER-

3106 RIVER RD

Purchase Order: PO1000126

Workorder: **3123284**

Workorder ID: 3RD QTR 2020-3106 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 21, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki , Ms. Jordan Gallagher , Landowner , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Susan J Scherer Project Coordinator

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SAMPLE SUMMARY

Workorder: 3123284 3RD QTR 2020-3106 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3123284001	3106 River Road, Conestoga, PA	Water	8/21/2020 12:36	8/21/2020 17:30	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3123284 3RD QTR 2020-3106 RIVER RD

Notes

- -- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.
- -- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- -- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- -- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- -- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- -- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

- J Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
- U Indicates that the analyte was Not Detected (ND)
- N Indicates presumptive evidence of the presence of a compound
- MDL Method Detection Limit
- PQL Practical Quantitation Limit
- RDL Reporting Detection Limit
- ND Not Detected indicates that the analyte was Not Detected at the RDL
- Cntr Analysis was performed using this container
- RegLmt Regulatory Limit
- LCS Laboratory Control Sample
- MS Matrix Spike
- MSD Matrix Spike Duplicate
- DUP Sample Duplicate
- %Rec Percent Recovery
- RPD Relative Percent Difference
- LOD DoD Limit of Detection
- LOQ DoD Limit of Quantitation
- DL DoD Detection Limit
- Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
- (S) Surrogate Compound
- NC Not Calculated
- * Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3123284 3RD QTR 2020-3106 RIVER RD

Lab ID: 312384001 Date Collected: 8/21/2020 12:36 Matrix: Water

Sample ID: 3106 River Road, Conestoga, PA Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS		·					·			
Benzene	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/27/20 06:19	VLM	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 06:19	VLM	K
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	Ву	Analyzed	Ву	Cntr
1,2-Dichloroethane-d4 (S)	117		%	62 - 133	SW846 8260B			8/27/20 06:19	VLM	K
4-Bromofluorobenzene (S)	79.7		%	79 - 114	SW846 8260B			8/27/20 06:19	VLM	K
Dibromofluoromethane (S)	103		%	78 - 116	SW846 8260B			8/27/20 06:19	VLM	K
Toluene-d8 (S)	97.7		%	76 - 127	SW846 8260B			8/27/20 06:19	VLM	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	12		mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	С
Alkalinity, Total	12	1	mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	Α
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			8/28/20 00:00	JXL	В
Chemical Oxygen Demand (COD)	24		mg/L	15	EPA 410.4			9/9/20 22:10	JAM	В
Chloride	109		mg/L	2.0	EPA 300.0			8/22/20 15:10	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/20 15:10	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/27/20 16:48	PAG	1
Nitrate-N	10.8		mg/L	0.20	EPA 300.0			8/22/20 15:10	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/22/20 15:10	MBW	С
рН	6.04	2	pH_Units		S4500HB-11			8/25/20 20:33	R2B	С
Phenolics	ND		mg/L	0.005	EPA 420.4	8/26/20 06:54	C_D	8/26/20 10:35	VXF	Н
Specific Conductance	469		umhos/cm	1	SM2510B-2011		_	8/25/20 20:33	R2B	С
Sulfate	5.6		mg/L	2.0	EPA 300.0			8/22/20 15:10	MBW	_
			··· <i>y</i> =					3,, _ 0 . 0 . 10	•	-

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ANALYTICAL RESULTS

Workorder: 3123284 3RD QTR 2020-3106 RIVER RD

Lab ID: 312384001 Date Collected: 8/21/2020 12:36 Matrix: Water

Sample ID: 3106 River Road, Conestoga, PA Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
Total Dissolved Solids	296		mg/L	25	S2540C-11			8/26/20 11:29	KXH	С
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/26/20 08:55	PAG	F
Turbidity	0.29		NTU	0.10	SM2130B-2011			8/22/20 07:50	R2B	С
METALS										
Calcium, Total	21.4		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 12:29	SRT	D
Calcium, Dissolved	22.2		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 16:16	SRT	E
Iron, Total	0.052		mg/L	0.030	EPA 200.7	8/25/20 17:03	SXC	8/26/20 12:29	SRT	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/25/20 07:29	SRT	8/27/20 16:16	SRT	Е
Magnesium, Total	14.6		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 12:29	SRT	D
Magnesium, Dissolved	14.9		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 16:16	SRT	Е
Manganese, Total	0.044		mg/L	0.0025	EPA 200.7	8/25/20 17:03	SXC	8/26/20 12:29	SRT	D
Manganese, Dissolved	0.045		mg/L	0.0050	EPA 200.7	8/25/20 07:29	SRT	8/27/20 16:16	SRT	E
Potassium, Total	2.3		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 12:29	SRT	D
Potassium, Dissolved	2.3		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 16:16	SRT	E
Sodium, Total	43.4		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 12:29	SRT	D
Sodium, Dissolved	46.2		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 16:16	SRT	E
FIELD PARAMETERS										
pH, Field (SM4500B)	5.24		pH_Units		Field			8/21/20 12:36	BGS	M
Specific Conductance, Field	452		umhos/cm	1	Field			8/21/20 12:36	BGS	M
Temperature	18.30		Deg. C		Field			8/21/20 12:36	BGS	M

Ms. Susan J Scherer Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3123284 3RD QTR 2020-3106 RIVER RD

PARAMETER QUALIFIER	IFIERS	AL	QU	ΓER	MET	Αľ	R	Α	P
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Lab ID	#	Sample ID	Analytical Method	Analyte
3123284001	1	3106 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity	is titrate	ed to a pH of 4.5 and reported as mg (CaCO3/L.	
3123284001	2	3106 River Road, Conestoga, PA	S4500HB-11	рН

The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3123284 3RD QTR 2020-3106 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3123284001	3106 River Road, Conestoga, PA	ASTM D6919-09		
3123284001	3106 River Road, Conestoga, PA	EPA 200.7	EPA ACID	
3123284001	3106 River Road, Conestoga, PA	EPA 200.7	EPA TRMD	
3123284001	3106 River Road, Conestoga, PA	EPA 300.0		
3123284001	3106 River Road, Conestoga, PA	EPA 410.4		
3123284001	3106 River Road, Conestoga, PA	EPA 420.4	420.4/9066	
3123284001	3106 River Road, Conestoga, PA	Field		
3123284001	3106 River Road, Conestoga, PA	S2540C-11		
3123284001	3106 River Road, Conestoga, PA	S4500HB-11		
3123284001	3106 River Road, Conestoga, PA	SM2130B-2011		
3123284001	3106 River Road, Conestoga, PA	SM2320B-2011		
3123284001	3106 River Road, Conestoga, PA	SM2510B-2011		
3123284001	3106 River Road, Conestoga, PA	SM5310B-2011		
3123284001	3106 River Road, Conestoga, PA	SW846 8260B		
3123284001	3106 River Road, Conestoga, PA	SW846 9020B		

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<				ರ	CHAIN OF CUSTODY/	FCUS	TOD	-	8	Generaled by ALS	<u> </u>			-
(ALS) Enutronmental	•			REO	REQUEST FOR ANALYSIS	FOR	M	SIS						₹
34 Obganned Larre - Wicklebrum, Ph. 1785) - Phanes, 2414-445 SAII - Fau 252-440 1430 - mars abydebal two			ALL SHA	ADED AREAS MUST BE COMPLETED BY THE CLIENT	AS MUS	DE CO	MPLE	DBY	₩	N				1
301 Fulling fills Road + Middletown, PA 17057 + 717.944.5541 + Fax; 717.944,1430	FBX; 717,944,14			SAMPL	SAMPLER. INSTRUCTIONS ON THE BACK.	RUCTION	SONT	HE BAC	ž		, 			
Client Name: LCSWMA - Aaron Fry		Container	AG	AN	AN	8	1	ಕ	٦,	٦	굽	* 3 1	23284*	y Receiving Lab)
Address: 3106 River Road		Container	40 ml	125 ml	250 ml	40 ml	1	250 ml	125 ml	125 ml	500 ml	SWITT COOL	Cooler Temp: / Inerm 1.0:	662:
Conestoga, PA 17516		Preservative	HCI	HZSO4	H2S04	호	1	H2S04	HN03	HNO3	None	None No. of	No. of Coolers:	N Initial
Contact: Aaron Fry					ANA	ANALYSES/METHOD REQUESTED	THOD R	GUEST	e			Γ	Custody Seals Present?	
Phone#: (717) 669-6831							_	Г	•				(if present) Seals Intact?	
Project Name/#: LCSWMA - Quarterly									nM ,	ę	,я,		Received on Ice?	
BIII To: LCSWMA - Aaron Fry									БМ.	°' N	†O 9	Š	COC/Labels Complete/Accurate?	
X Normal-Standard TAT is 10-12 business days.	ess days.								, Fe,	y 'uy	cı's		Cont. in Good Cond.?	
Rush-Subject to ALS approval and surcharges.	urcharges.					so			eg:	y 'Gy	,EO		Correct Containers?	
Date Required: Approved By:						ΟΛ			els):	N '9	S' N	603	Correct Sample Volumes?	
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James		O 10 trix	00	101	хо	8M	W	-ен	ossi sN ,	etal	T ,H		Headspace/Volatiles?	
- 4	Time	Ws	1		Enter Number of Containers Per Sample	r of Contai	ners Per S	ample or	Field Res	or Field Results Below	lq .		Courier Lacking #: Sample/COC Comments	nents
1 3106RIVERRD 08/21/20	20 1236	G DW	~	-	2	2 ×		-	-	-	-	-		
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Project Comments:	LOGGED BY(signature):	(signature):	H				JIVQ.	П	361	3201	s	Standard	Special Processing	State Samples
	REVIEWED BY(signature):	Y(signature	ë				tivo			tera	ita rable	CLP-like	USACE	Collected In
Relinquished By (Company Name	Date	-		Receiv	Received By / Company Name	mpany N	ame		Date	Time		JUSACE	Navy	Ž
1 ASOCIAMONE ALS	8-21-20	1730	2		11	dalla	1	18	2///3	1330	a			2
3			4								Report	Reportable to PADEP?	? Sample Disposal	× ¥
5			9					2 3			Yes		rap Y	NC
7											PWSID #		Special	
6	I		9								EDDS: F	EDDS: Format Type-		
• G=Grab; C=Composite	0	atrix - Al=A	Vir, DW=D	Inking Wat	er. GW=Gn	oundwater,	Ol=Oil; Ol	=Other L	quid; St.=	Sludge; S	Soll; Wi	"Matrix - Al=Air, DW=Drinking Water, GW=Groundwater, Oi=Oil, OL=Other Liquid; SL=Sludge, SO=Soil; WP=Wipe, WW=Wastewater	Vastewater	
	ALS EIN	MINIONIN	N W	SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLE LOWN, PA 17057	ADDRES	34 00	owe owe	SNE.	MUDDLE	CWN.	A 1/057			Rev 8/04



301 Fulling Mill Road Middletown, PA 17057

P: (717) 944-5541 F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWMA Work Order #: 3123284 Initials: DN	ate:	3/21	
1. Were airbills / tracking numbers present and recorded?	ØNE	YES	NO
2. Are Custody Seals on shipping containers intact?	TONE	YES	NO
3. Are Custody Seals on sample containers intact?		YES	NO
4. Is there a COC (Chain-of-Custody) present?		483	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
Sa. Does the COC contain sample locations?		ES	NO
5b. Does the COC contain sample locations:		(ES	NO
Sc. Does the COC contain date and time of sample contection of an samples		VES.	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		(C)	NO
5g. Does the COC note the matrix of the sample(s)?		YES	NO
	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YBS	NO
8. Are all samples within holding times for the requested analyses?		AE2	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?		169	NO
11 Were the samples received on ice?		(E)	NO
1 Pm0 > 10		YES	(NO)
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(FE)	NO
13a. Are the samples required for SDWA compliance reporting?		YES	NO
	N/A	YES	NO
	N/A	YES	NO
	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO
Temperature (°C): 16 Thermometer ID: 794 Radiological (µCi):			
nationality (per).			-

COMMENTS (Required for all NO responses above and any sample non-conformance):

¹Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis

Rev 1/20/2020





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September 10, 2020

Mr. Daniel Brown Lancaster County Solid Waste Authority 1299 Hbg Pike, P.O. Box 4425 Lancaster, PA 17604

Certificate of Analysis

Project Name: CONTIGUOUS LANDOWNER- Workorder:

3125 RIVER RD

Purchase Order: PO1000126 Workorder ID: 3RD QTR 2020-3125 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 21, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki , Ms. Jordan Gallagher , Landowner , Mr. Jeff

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Ms. Susan J Scherer Project Coordinator

3123283

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SAMPLE SUMMARY

Workorder: 3123283 3RD QTR 2020-3125 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3123283001	3125 River Road, Conestoga, PA	Water	8/21/2020 13:00	8/21/2020 17:30	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3123283 3RD QTR 2020-3125 RIVER RD

Notes

- -- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.
- -- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- -- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- -- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- -- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- -- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

- J Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
- U Indicates that the analyte was Not Detected (ND)
- N Indicates presumptive evidence of the presence of a compound
- MDL Method Detection Limit
- PQL Practical Quantitation Limit
- RDL Reporting Detection Limit
- ND Not Detected indicates that the analyte was Not Detected at the RDL
- Cntr Analysis was performed using this container
- RegLmt Regulatory Limit
- LCS Laboratory Control Sample
- MS Matrix Spike
- MSD Matrix Spike Duplicate
- DUP Sample Duplicate
- %Rec Percent Recovery
 RPD Relative Percent Di
- RPD Relative Percent Difference LOD DoD Limit of Detection
- LOQ DoD Limit of Quantitation
- DL DoD Detection Limit
- I Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
- (S) Surrogate Compound
- NC Not Calculated
- * Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3123283 3RD QTR 2020-3125 RIVER RD

Lab ID: 312383001 Date Collected: 8/21/2020 13:00 Matrix: Water

Sample ID: 3125 River Road, Conestoga, PA Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/27/20 05:59	PDK	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/27/20 05:59	PDK	K
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	Ву	Analyzed	Ву	Cntr
1,2-Dichloroethane-d4 (S)	92.2		%	62 - 133	SW846 8260B			8/27/20 05:59	PDK	K
4-Bromofluorobenzene (S)	104		%	79 - 114	SW846 8260B			8/27/20 05:59	PDK	K
Dibromofluoromethane (S)	94.9		%	78 - 116	SW846 8260B			8/27/20 05:59	PDK	K
Toluene-d8 (S)	102		%	76 - 127	SW846 8260B			8/27/20 05:59	PDK	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	124		mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	С
Alkalinity, Total	124	1	mg/L	5	SM2320B-2011			8/25/20 20:33	R2B	Α
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			8/29/20 02:20	JXL	В
Chemical Oxygen Demand (COD)	21		mg/L	15	EPA 410.4			9/9/20 22:10	JAM	В
Chloride	85.0		mg/L	2.0	EPA 300.0			8/22/20 13:34	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/20 13:34	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/27/20 16:18	PAG	1
Nitrate-N	4.7		mg/L	0.20	EPA 300.0			8/22/20 13:34	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/22/20 13:34	MBW	С
рН	6.89	2	pH_Units		S4500HB-11			8/25/20 20:33	R2B	С
Phenolics	ND		mg/L	0.005	EPA 420.4	8/26/20 06:54	C_D	8/26/20 10:35	VXF	Н
Specific Conductance	563		umhos/cm	1	SM2510B-2011			8/25/20 20:33	R2B	С
Sulfate	9.8		mg/L	2.0	EPA 300.0			8/22/20 13:34	MBW	С

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ANALYTICAL RESULTS

Workorder: 3123283 3RD QTR 2020-3125 RIVER RD

Lab ID: 312383001 Date Collected: 8/21/2020 13:00 Matrix: Water

Sample ID: 3125 River Road, Conestoga, PA Date Received: 8/21/2020 17:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
Total Dissolved Solids	300		mg/L	25	S2540C-11			8/26/20 11:29	KXH	С
Total Organic Carbon (TOC)	0.61		mg/L	0.50	SM5310B-2011			8/26/20 08:55	PAG	F
Turbidity	0.16		NTU	0.10	SM2130B-2011			8/22/20 07:50	R2B	С
METALS										
Calcium, Total	0.30		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 12:26	SRT	D
Calcium, Dissolved	0.28		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:57	SRT	Е
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/25/20 17:03	SXC	8/26/20 12:26	SRT	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:57	SRT	Е
Magnesium, Total	0.056		mg/L	0.050	EPA 200.7	8/25/20 17:03	SXC	8/26/20 12:26	SRT	D
Magnesium, Dissolved	ND		mg/L	0.10	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:57	SRT	E
Manganese, Total	ND		mg/L	0.0025	EPA 200.7	8/25/20 17:03	SXC	8/26/20 12:26	SRT	D
Manganese, Dissolved	ND		mg/L	0.0050	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:57	SRT	Е
Potassium, Total	2.3		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 12:26	SRT	D
Potassium, Dissolved	2.0		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:57	SRT	Е
Sodium, Total	120		mg/L	0.25	EPA 200.7	8/25/20 17:03	SXC	8/26/20 12:26	SRT	D
Sodium, Dissolved	125		mg/L	0.50	EPA 200.7	8/25/20 07:29	SRT	8/27/20 15:57	SRT	Е
FIELD PARAMETERS										
pH, Field (SM4500B)	6.16		pH_Units		Field			8/21/20 13:00	BGS	M
Specific Conductance, Field	554		umhos/cm	1	Field			8/21/20 13:00	BGS	M
Temperature	21.00		Deg. C		Field			8/21/20 13:00	BGS	M

Ms. Susan J Scherer Project Coordinator

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3123283 3RD QTR 2020-3125 RIVER RD

PA	RAN	IETER	QUAL	IFIERS
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Lab ID	#	Sample ID	Analytical Method	Analyte
3123283001	1	3125 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity	is titrate	ed to a pH of 4.5 and reported as mg (CaCO3/L.	
3123283001	2	3125 River Road, Conestoga, PA	S4500HB-11	рН

The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3123283 3RD QTR 2020-3125 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3123283001	3125 River Road, Conestoga, PA	ASTM D6919-09		
3123283001	3125 River Road, Conestoga, PA	EPA 200.7	EPA ACID	
3123283001	3125 River Road, Conestoga, PA	EPA 200.7	EPA TRMD	
3123283001	3125 River Road, Conestoga, PA	EPA 300.0		
3123283001	3125 River Road, Conestoga, PA	EPA 410.4		
3123283001	3125 River Road, Conestoga, PA	EPA 420.4	420.4/9066	
3123283001	3125 River Road, Conestoga, PA	Field		
3123283001	3125 River Road, Conestoga, PA	S2540C-11		
3123283001	3125 River Road, Conestoga, PA	S4500HB-11		
3123283001	3125 River Road, Conestoga, PA	SM2130B-2011		
3123283001	3125 River Road, Conestoga, PA	SM2320B-2011		
3123283001	3125 River Road, Conestoga, PA	SM2510B-2011		
3123283001	3125 River Road, Conestoga, PA	SM5310B-2011		
3123283001	3125 River Road, Conestoga, PA	SW846 8260B		
3123283001	3125 River Road, Conestoga, PA	SW846 9020B		

ALS Environmental Laboratory Locations Across North America

Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

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State Samples CRental_Equipment Rev 8/04 Collected in eted by Receiving Lab) Initial DPickup OLabor ₹ È ğ Z 544 × Sample/COC Comments Therm ID: × Special Processing Sample Disposal eg G USACE Nawy Headspace/Volatiles? Custody Seals Present? (if present) Seals Intact? Received on Ice? COCILabels Complete/Accurate? Cont. in Good Cond.? Correct Containers? Correct Sample Volumes? Correct Preservation? Special Composite_Sampling ALS Field Services: Courier/Tracking #: No. of Coolers: **Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oii; OL=Other Liquid; SL=Sludge; SO=Soii; WP=Wipe; WW=Wastewater Cooler Temp: œ □Other: Reportable to PADEP? Standard CLP-like USACE EDDS: Format Type 500 ml None Alkalinity, HCO3 PWSID # Yes ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057 500 ml Tb, SpC Deliverables None pH, TDS, NO2, NO3, CI, SO4, F, eted Generated by ALS Field Results Belo 125 ml Time ದ Metals: Ca, Fe, Mg, Mn, K, Na ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT 125 ml HN03 K, Na Date ಷ Dissolved Metals: Ca, Fe, Mg, Mn, ANALYSES/METHOD REQUESTED SAMPLER. INSTRUCTIONS ON THE BACK H2S04 250 ml REQUEST FOR ANALYSIS Enter Number of Containers Per Sample ᇫ NH3-N' COD CHAIN OF CUSTODY/ Received By / Company Name EW. 40 m 8 오 SW846-8260 VOCS H2S04 250 ml ₹ XOI N 125 ml H2S04 ¥ HO-O 40 mg 오 å 2 100 REVIEWED BY(signature): M Preservative xinteM* OGGED BY(signature): Container Time 05% 2 Size ပ J 10 9. 301 Fulling Mill Road • Middletown, PA 17057 • 717,944,5541 • Fax; 717,944,1430 のいても 1300 Time Date Rush-Subject to ALS approval and surcharges. X Normal-Standard TAT is 10-12 business days. * G=Grab; C=Composite Approved By: 08/21/20 hi Depended Lare a similarism, Pa 17057 a Plance, Pid-tak Set a faul 719-944-1430 a seem displication Sample Date A S Relinquished By/ Company Name Client Name: LCSWMA - Christian C. Beck Bill To: Lancaster County Solid Waste MA Project Name#: LCSWMA - Quarterly Sample Description/Location 2.2 (as it will appear on the lab report) Conestoga, PA 17516 ALS Environmental Christian C. Beck Address: 3125 River Road Phone#: (717) 871-0448 --- No ڄ 13125RIVERRD Project Comments: Date Required: Contact: TAT Emall? Fax 3



301 Fulling Mill Road Middletown, PA 17057

P: (717) 944-5541 F: (717) 944-1430

Condition of Sample Receipt Form

3/23283

1. Were airbills / tracking numbers present and recorded?	Client: LCSWMA Work Order #: 313282 Initials: DN	Date:	8/II	
3. Are Custody Seals on sample containers intact? 4. Is there a COC (Chaim-of-Custody) present? 5. Are the COC and bottle labels complete, legible and in agreement? 5. Are the COC and bottle labels complete, legible and in agreement? 5. Does the COC contain sample locations? 5. Does the COC contain sample locations? 5. Does the COC contain sample collectors name? 5. Does the COC contain sample collectors name? 5. Does the COC note the type(s) of preservation for all bottles? 5. Does the COC note the type(s) of preservation for all bottles? 5. Does the COC note the number of bottles submitted for each sample? 5. Does the COC note the type of sample, composite or grab? 5. Does the COC note the type of sample, composite or grab? 5. Does the COC note the matrix of the sample(s)? 6. Are all aqueous samples requiring preservation preserved correctly? 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 7. Were all samples within holding times for the requested analyses? 7. So No 7. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 7. Were the samples received on ice? 7. Cooler #15 7. So No 7. So No 7. Are the samples received on ice? 7. So No 7.		€ NE	YES	NO
3. Are Custody Seals on sample containers intact? 4. Is there a COC (Chaim-of-Custody) present? 5. Are the COC and bottle labels complete, legible and in agreement? 5. Are the COC and bottle labels complete, legible and in agreement? 5. Does the COC contain sample locations? 5. Does the COC contain sample locations? 5. Does the COC contain sample collectors name? 5. Does the COC contain sample collectors name? 5. Does the COC note the type(s) of preservation for all bottles? 5. Does the COC note the type(s) of preservation for all bottles? 5. Does the COC note the number of bottles submitted for each sample? 5. Does the COC note the type of sample, composite or grab? 5. Does the COC note the type of sample, composite or grab? 5. Does the COC note the matrix of the sample(s)? 6. Are all aqueous samples requiring preservation preserved correctly? 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 7. Were all samples within holding times for the requested analyses? 7. So No 7. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 7. Were the samples received on ice? 7. Cooler #15 7. So No 7. So No 7. Are the samples received on ice? 7. So No 7.	2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present? 5. Are the COC and bottle labels complete, legible and in agreement? 5. Does the COC contain sample locations? 5. Does the COC contain sample collectors name? 5. Does the COC contain sample collectors name? 5. Does the COC note the type(s) of preservation for all samples? 5. Does the COC note the type(s) of preservation for all bottles? 5. Does the COC note the number of bottles submitted for each sample? 5. Does the COC note the matrix of the sample(s)? 6. Are all adveous samples requiring preservation preserved correctly? 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 8. Are all samples within holding times for the requested analyses? 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 11. Were the samples required for SDWA compliance reporting? 12. Were sample temperatures measured at 0.0-6.0°C 13. Are the samples required for SDWA compliance reporting? 13. Are the samples required for SDWA compliance reporting? 13. Are the samples required for SDWA compliance reporting? 13. Are the samples required for SDWA samples pH 5-9? 13. Are the samples required for SDWA samples pH 5-9? 13. Are blick client provide a SDWA PWS ID#? 13. Are all aqueous unpreserved SDWA samples ph 5-9? 13. Are blick client provide the SDWA sample location ID/Description? 13. Are blick client provide the SDWA sample spH 5-9? 13. Are blick client provide the SDWA samples pH 5-9? 14. Premometer ID: 794 15. Premometer ID: 794 16. Premometer ID: 794 17. Premometer ID: 794 18. Premometer ID: 794 18. Premometer ID: 794		, ,	YES	NO
S. Are the COC and bottle labels complete, legible and in agreement?			. 4ES	NO
Sb. Does the COC contain date and time of sample collection for all samples? Sc. Does the COC contain sample collectors name? Sc. Does the COC note the type(s) of preservation for all bottles? Sc. Does the COC note the number of bottles submitted for each sample? Sc. Does the COC note the number of bottles submitted for each sample? Sc. Does the COC note the type of sample, composite or grab? Sc. Does the COC note the matrix of the sample(s)? Sc. Does the COC note the matrix of the sample(s)? And Sc. Does the COC note the matrix of the sample(s)? And all aqueous samples requiring preservation preserved correctly? No. Are all samples placed in the proper containers for the requested analyses, with sufficient volume? Sc. Are all samples within holding times for the requested analyses, with sufficient volume? Sc. No. Sc. Are all samples within holding times for the requested analyses? No. Sc. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) Sc. No. No. Sc. No. No. No. No. No. No. No. No. No. No				NO
Sc. Does the COC contain sample collectors name?	5a. Does the COC contain sample locations?		. ES	NO.
Sd. Does the COC note the type(s) of preservation for all bottles?	5b. Does the COC contain date and time of sample collection for all samples?	,	. YES	NO
Se. Does the COC note the number of bottles submitted for each sample? Sf. Does the COC note the type of sample, composite or grab? Sg. Does the COC note the matrix of the sample(s)? 6. Are all aqueous samples requiring preservation preserved correctly? 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 9. Were all samples within holding times for the requested analyses? 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C 13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? N/A YES NG 13c. Are all aqueous unpreserved SDWA samples pH 5-9? NA YES NG 13d. Did the client provide the SDWA sample byea (D, E, R, C, P, S)? NA YES NA Padiological (vic.): 12 Padiological (vic.): 13 Padiological (vic.): 14 Padiological (vic.):	Sc. Does the COC contain sample collectors name?		. 105	NO
Sf. Does the COC note the type of sample, composite or grab? 5g. Does the COC note the matrix of the sample(s)? 6. Are all aqueous samples requiring preservation preserved correctly? NO 6. Are all samples placed in the proper containers for the requested analyses, with sufficient volume? NO 8. Are all samples within holding times for the requested analyses? 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? NO 11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C 13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? NO 13c. Are all aqueous unpreserved SDWA samples pH 5-9? 13d. Did the client provide the SDWA sample location ID/Description? NA YES NO Cooler #: Temperature (°C): H Thermometer ID: Padiological (VCI): Padiological (VCI):	5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5g. Does the COC note the matrix of the sample(s)? 6. Are all aqueous samples requiring preservation preserved correctly? N/A 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 8. Are all samples within holding times for the requested analyses? 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C 13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? 13c. Are all aqueous unpreserved SDWA sample spH 5-9? 13d. Did the client provide the SDWA sample location ID/Description? N/A YES NO 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? Temperature (°C): 14 15 PA GOOD PROVIDED	Se. Does the COC note the number of bottles submitted for each sample?		. YES	NO
6. Are all aqueous samples requiring preservation preserved correctly? 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 8. Are all samples within holding times for the requested analyses? 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C 13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? 13c. Are all aqueous underserved SDWA samples pH 5-9? 13d. Did the client provide the SDWA sample location ID/Description? 13d. Did the client provide the SDWA sample type (D, E, R, C, P, S)? 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? 14c. Temperature (°C): 14d. Thermometer ID: 794	Sf. Does the COC note the type of sample, composite or grab?		. Gs	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?	5g. Does the COC note the matrix of the sample(s)?		. V25	NO
8. Are all samples within holding times for the requested analyses?	6. Are all aqueous samples requiring preservation preserved correctly?1	N/A	ES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.). 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?. N/A NO 11. Were the samples received on ice?	7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		. Es	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? N/A 11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C 13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below. 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? 13c. Are all aqueous unpreserved SDWA samples pH 5-9? 13d. Did the client provide the SDWA sample location ID/Description? 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	8. Are all samples within holding times for the requested analyses?		VES	NO
11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C. 13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below. 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? 13c. Are all aqueous unpreserved SDWA samples pH 5-9? 13d. Did the client provide the SDWA sample location ID/Description? 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? Temperature (°C): 14 Thermometer ID: 794 Padiological (VCD):	9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		. YES	NO
13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below. 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? 13c. Are all aqueous unpreserved SDWA samples pH 5-9? 13d. Did the client provide the SDWA sample location ID/Description? 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? Temperature (°C): 14 Thermometer ID: 794 Padiological (VCI):			_	NO
13. Are the samples DW matrix? If YES, fill out Reportable Drinking Water questions below. 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? 13c. Are all aqueous unpreserved SDWA samples pH 5-9? 13d. Did the client provide the SDWA sample location ID/Description? 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? Temperature (°C): 14 Thermometer ID: 794 Padiological (VCI):	11. Were the samples received on ice?		(E)	NO
13a. Are the samples required for SDWA compliance reporting?	12. Were sample temperatures measured at 0.0-6.0°C		. YES	M
13b. Did the client provide a SDWA PWS ID#?			(E)	Nd
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	13a. Are the samples required for SDWA compliance reporting?	N/A	YES	(B)
13d. Did the client provide the SDWA sample location ID/Description?	13b. Did the client provide a SDWA PWS ID#?	N/A	YES	Nd
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	Nd
Temperature (°C): 14 Thermometer ID: 794	13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
Temperature (°C): 14 Thermometer ID: 794	13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO
Thermometer ID: 794	Cooler #t*			
Padiological (uCi):	Temperature (°C): 14			
Radiological (µCi):	Thermometer ID: 799			
	Radiological (μCi):	نيمتي دي!		

COMMENTS (Required for all NO responses above and any sample non-conformance):

³Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis

Rev 1/20/2020